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Documentation of the Static World Policy Simulation (SWOPSIM) Modeling Framework

Vernon Roningen
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Documentation of the Static World Policy Simulation (SWOPSIM) Modeling Framework. By Vernon Roningen, John Sullivan, and Praveen Dixit, Agriculture and Trade Analysis Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES 9151.

Abstract

This report documents the static world policy simulation (SWOPSIM) model building framework. The framework consists of computer programs which generate standard global partial equilibrium models in spreadsheets. SWOPSIM models are designed to simulate the effect of changes in producer and consumer support policies on production, consumption, and trade. Several types of world models can be constructed including single product models, multi-product net trade models, and Armington type bilateral trade flow models. Economic linkages across products within a country occur via cross price and "input-output" relationships. Linkages across countries and regions take place through domestic-international price linkage equations and world product trade. Topics covered include the economics of SWOPSIM models and the mechanics of the model building with the SWOPSIM framework. An extensive reference section lists source documents as well as published studies that have used the framework. The bulk of the documentation consists of detailed appendices which include annotated listings of variable definitions and model equations, a listing of a SWOPSIM demonstration model, screens of computer tutorials on SWOPSIM model building, printouts of the computer programs making up the SWOPSIM framework, and SWOPSIM installation instructions.

Keywords: Agricultural trade, Armington model, bilateral trade flow model, net trade model, trade model, trade policy, producer subsidy equivalent, regional trade model, simulation model, spreadsheet model, SWOPSIM, world trade model.

Acknowledgments

We recognize Steve Haley, Henry Haszler, Barry Krissoff, Robert Koopman, Liana Neff, Steve Magiera, Jerry Sharples, and all of the other ERS, university, and foreign researchers who have so effectively used the SWOPSIM framework for economic analysis. They have made SWOPSIM a "tool for economic analysis in our time." We thank Bonnie Moore for editorial assistance.

1301 New York Ave., NW
Washington, DC 20005-4788

September 1991

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Documentation of the Static World Policy Simulation (SWOPSIM) Modeling Framework

Vernon Roningen, John Sullivan, and Praveen Dixit

Introduction

This report documents the static world policy simulation (SWOPSIM) modeling framework. It is an updated and more extensive version of the two earlier documents that described the modeling framework (69,76). A broad overview of the SWOPSIM modeling framework is provided followed by an illustrated discussion of the economic structure of SWOPSIM models. The mechanics of the framework are then outlined with examples from the creation of a demonstration model. The report concludes with some model/data manipulation features of the SWOPSIM framework which expand the usefulness of existing SWOPSIM data sets.

Detailed information about the modeling framework is presented in appendices. This includes a complete listing of SWOPSIM variables and equations for a product, an annotated listing of the standard 22-product demonstration model, listings of DOS batch and BASIC computer programs which constitute the SWOPSIM framework, a presentation of computer screens seen when running SWOPSIM computer tutorials, and instructions for the installation of the SWOPSIM modeling framework.

It is recommended that new users of the system start with the Overview section (pp. 1-13) and then jump to the discussion of the mechanics of building a model (pp. 28-44). Once they feel comfortable with the overall framework, the computer tutorials (described in Appendix C) should be run after SWOPSIM has been installed (Appendix E). If the user decides to build a new model, he should study the economic structure of the model (pp. 14-27). Advanced users of the SWOPSIM framework may find the part that describes the additional features (pp. 45-51) helpful. The other appendices should be consulted as needed.

Overview of the SWOPSIM Modeling Framework

The first part of this report gives an overview of the SWOPSIM modeling framework. The history of SWOPSIM is presented followed by a brief discussion of the SWOPSIM modeling strategy. The characteristics of SWOPSIM models are summarized followed by the economics, the data requirements, and the computer hardware and software required for SWOPSIM. Finally, some of the options available within the SWOPSIM framework are summarized.

History

Work on the SWOPSIM modeling framework started in the summer of 1985 when the Economic Research Service (ERS) wanted to address three specific issues: (1) how levels of assistance to agriculture compare across countries and commodities, (2) how assistance to agriculture in industrial market economies has distorted world production and trade, and (3) the economic impact of removing assistance to agriculture in industrial market economies.

ERS initial estimates of the levels of assistance to agriculture across commodities and countries were published in 1987 (89).[1] Using a methodology developed by the Organization for Economic Cooperation and Development (OECD), ERS calculated producer and consumer subsidy equivalents (PSEs and CSEs) for agriculture for a number of commodities and countries (65). Since then, there have been two follow-ups to the original ERS report. The latest ERS publication (88) provides estimates of agricultural support for 28 countries, including several developing and centrally planned countries.

Summary measures of protection such as the PSEs and CSEs are indicators of the support to agriculture but do not incorporate potential supply and demand responses to changes in support levels. They do not account for offsetting policies such as supply controls which might accompany other support measures. Therefore PSEs and CSEs may have little to say, by themselves, about the distortionary implications of support policies or the consequences of support on commonly used indicators of economic performance.

If support changes are expected to have consequences for world markets, a global agricultural trade model is needed to adequately address the issue. ERS undertook to build such a model and the SWOPSIM framework evolved as the construction tool. The OECD (65) and Tyers and Anderson (87) were in the process of completing global models for the analysis of support and ERS was able to observe and draw on these experiences in constructing its own system. One of the first informal tests of the SWOPSIM system after its initial construction was its use to emulate the OECD and Tyers and Anderson's model, using their parameters and data to duplicate their results.

The initial version of the SWOPSIM framework was completed in 1986 (69). How Level is the Playing Field?: An Economic Analysis of Agricultural Policy Reform in Industrial Market Economies (71) represents the principal study that used SWOPSIM and ERS agricultural support information to evaluate the consequences of agricultural protection on a global basis. This study shows the full power of a comprehensive global data set and model in illustrating whose support distorts world agricultural trade. Several other studies used the framework to build models for various purposes. The references cited include most studies to date that have used a version of the SWOPSIM framework as a research tool.

Like any research tool, the SWOPSIM framework has undergone a number of changes since 1986. Some of these changes reflect modifications required to address ongoing issues or improve particular model specification. Others take advantage of improvements in both the hardware and software that are used to run the framework. The current operating version of the SWOPSIM framework is documented in this report along with an example from a current demonstration model.

The SWOPSIM Modeling Strategy

The basic modeling strategy for SWOPSIM models is to keep things as simple as possible to get the job done. Economists can deal with all sorts of complexity with the full power of mathematics. But sometimes the best

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[1]Underscored numbers in parentheses refer to items cited in the References section.

economic analysis comes from the simplification and clarification of problems with sound, but simple economics.

The economic structure of SWOPSIM models is simple. This does not mean that more complexity cannot be added, but it does suggest that when the choice is between more complexity and a proximate representation of complex issues in a simple way, the latter choice prevails. This approach assumes that different economic and policy structures can be captured and parameterized in a simple standard economic structure. The reward is not only a common framework of analysis, but also the ability to assemble large models that include many products and countries. The alternative modeling strategy would be to include as much complexity as needed to satisfy the most demanding product and country analyst and somehow link these specialized models into a global economic model via international trade and price linkages.

Another important aspect of the SWOPSIM modeling strategy is to make models transparent; that is, avoid creating mathematical black boxes which are understandable to only their creator and a small group of modeling professionals. The SWOPSIM framework avoids this black box trap partly by keeping the economic structure simple and uniform. Equally important is the use of the spreadsheet as the operating and storage mechanism for data and models.[2] The spreadsheet is a universal analytical tool these days for most economic analysts. The use of a spreadsheet based modeling system makes the inner workings of SWOPSIM models open to users without having to learn programming languages or specialized model simulation packages. To the extent possible, SWOPSIM computer programs which operate on spreadsheets contain their own documentation and explanatory prompts so that a user understands what is happening.

Finally, an important part of the SWOPSIM modeling strategy is to present a clear and compelling story about the simulation results with a model.[3] While such a story requires a clear economic view of the problem being analyzed, the SWOPSIM framework was designed to help the user clearly understand the model results. For example, a standard solution output routine provides a helpful layout of the components of a result for any product in a model. This makes it easy for the user to know what is more important and what is less important in causing a particular result.

Characteristics of SWOPSIM Models

SWOPSIM is a modeling framework, not a model in itself. It is a software package that can be used to build various types of simple standard global models linked by trade. All standard models created by the SWOPSIM framework have certain characteristics.

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[2]The spreadsheet environment for model building, while having some constraints, turns out to have many practical advantages. Models can be readily modified or customized, data and model output can be readily manipulated, large problems and computational tasks can be easily broken down into sets of small tasks, and surprisingly, often troublesome problems such as the solution of unstable models are easier to cope with in the spreadsheet environment than in other more complex modeling systems.

[3]The death knell of many economic models has been a statement by the model builder "the model says that .....".

Static: SWOPSIM models are static. They calculate the implications of policy reform or other economic shocks after full model adjustment, but will not give the time path of adjustment. Stocks are not modeled and therefore assumed unchanged. SWOPSIM models can be used for counterfactual analysis and for projections to a future equilibrium state.

Nonspatial: SWOPSIM models provide information on the net trade flows of a country or region but do not normally provide trade flows among countries. In other words, importers are assumed not to distinguish commodities by source of origin, and domestic and traded goods are assumed to be perfect substitutes in consumption.

Multi-product, multi-region: The SWOPSIM framework can build multi-product, multi-country models to a maximum of 60-70 products and 38 regions.[4] The actual size of a model is governed by data availability and computer hardware restrictions. The data set used for most SWOPSIM models at ERS has 22 products, covering the grain-oilseeds-livestock complex for up to 36 countries/regions of the world (86).

Partial equilibrium: SWOPSIM models normally examine relationships within a sector (e.g. agriculture), not resource shifts between sectors (e.g. agriculture versus other sectors). Factor prices and other general equilibrium conditions are assumed to be fixed in the standard framework.

Synthetic: SWOPSIM model parameters (elasticities and technical coefficients) are not estimated with the SWOPSIM framework; rather, they are obtained from the literature (13) or can be estimated econometrically. However, theoretically valid behavioral relationships can be imposed on the supply and demand elasticities actually used. These relationships contribute to theoretical purity of the system and, from a practical solution viewpoint, encourage model stability.

Policy-oriented: SWOPSIM models are designed to analyze the economic implications of policy changes that can have a global impact. They are more suited to study total liberalization of all policies, though they can be used for studies of partial reform as well.

A policy is usually represented in SWOPSIM models by a fixed price wedge: a wedge between the traded price and the domestic incentive price. The policy price wedge data are obtained from ERS calculations of producer and consumer subsidy equivalents (88,89) where a wide range of support policies were translated into a common measure. Policies can also be implicitly introduced into SWOPSIM models through price transmission parameters that regulate the transmission of world price changes to the domestic economy, and by shifting supply equations to capture production control policies. Policies such as income supplements may be included with appropriate shifts in demand schedules.

Spreadsheet based: Data, parameters, and solution output from SWOPSIM models are maintained in spreadsheets on personal computers (PCs). This requires a

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[4]The framework can construct a single commodity global model from a data set. Also, multi-product, multi-country models can be assembled *ceteris paribus*, holding values for selected products or countries constant.

potential SWOPSIM user to know spreadsheet technology and have an understanding of the PC Disk Operating System (DOS).

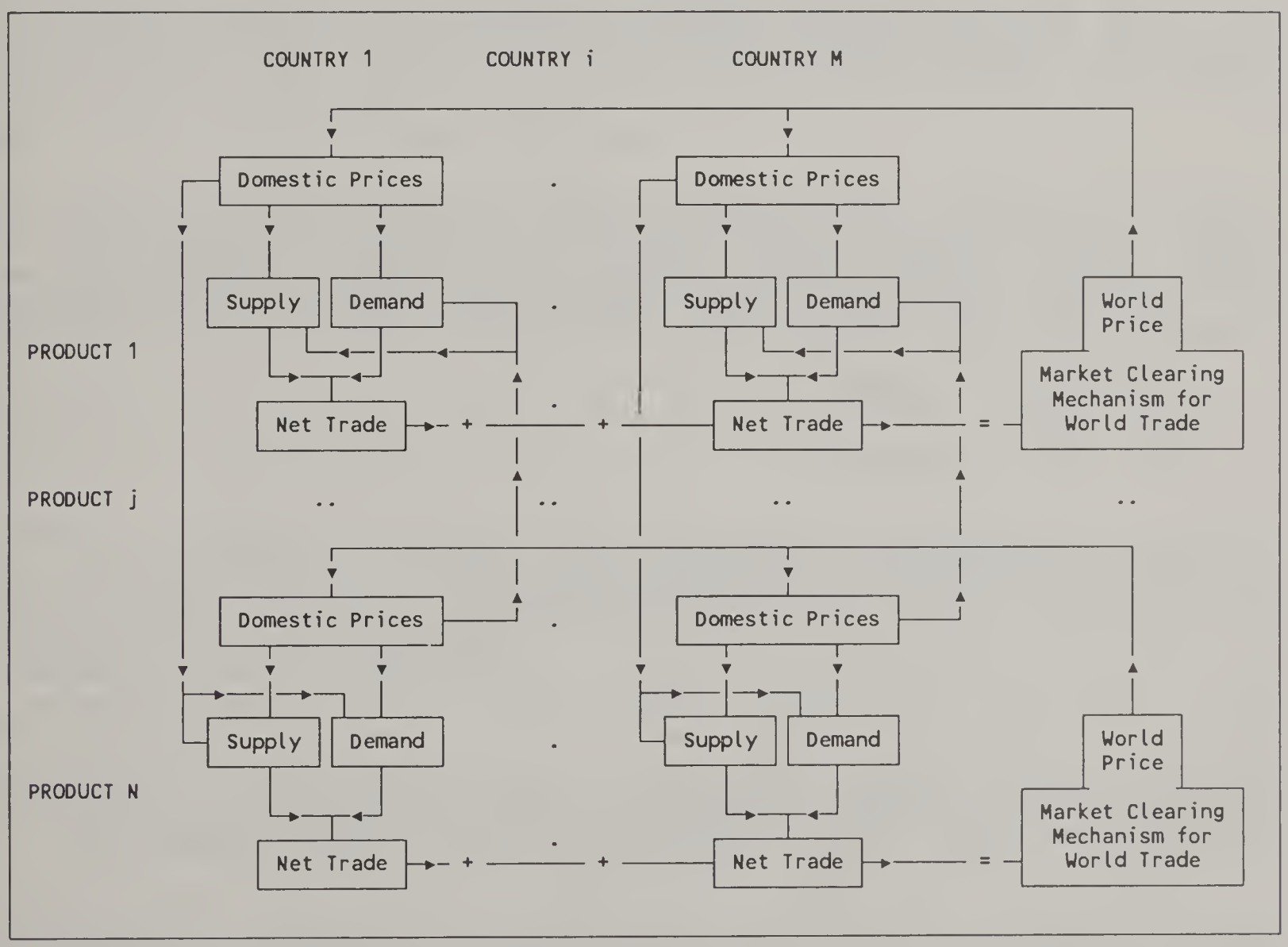
The SWOPSIM framework consists of computer programs which perform repetitive operations on data and a standardized model maintained in spreadsheets. The programs write and run spreadsheet macro commands which, in turn, carry out spreadsheet data manipulations and calculations. Series of programs carry out their tasks under the command of DOS batch programs.

Although the user does not have to write programs or macros to use the SWOPSIM framework, some knowledge about the working medium is helpful, especially when things go wrong. Experience has shown that many of the problems for potential users arise from an inadequate understanding of spreadsheets or PC DOS. Knowledgeable spreadsheet users, on the other hand, have quickly adapted the SWOPSIM framework to their own research agenda and have been able to modify default ERS SWOPSIM models to their particular research needs.

The Economics of SWOPSIM Models

The economics of models created by the SWOPSIM modeling framework assume that a product sector in a country can be represented by a set of simple supply, demand, and trade equations. The economic structure of a M country, N product SWOPSIM world model is shown in figure 1 in terms of information flows between products and countries.

Figure 1--Economic structure of SWOPSIM world models



A world market clearing mechanism clears world trade for each product, yielding a world price. This feeds back into domestic prices which drive product supply, demand, and net trade. Net trade summed across countries, goes to world market clearing mechanism again. Cross product linkages occur within countries via prices and direct quantity relationships (not shown in figure 1).

A linked world model is created by creating these equations for all countries, initializing the model to reproduce observed data, and allowing world markets for all products to clear. For each region i and each product j in the model, demand (D) and supply (S) relationships are modeled as:

$$D_{ij} = D_{ij}(CP_{ij}, CP_{ik}, QS_{ih}, TD_{ij}) \qquad (1)$$

$$S_{ij} = S_{ij}(PP_{ij}, PP_{ik} \text{ or } CP_{ik}, TS_{ij}) \qquad (2)$$

where CP_{ij} and PP_{ij} are domestic incentive prices facing consumers and producers, respectively, of product j in country i. CP_{ik} and PP_{ik} are consumer and producer prices of products related to product j in either consumption or production, respectively. QS_{ih} in the demand function accounts for the use of product j as an intermediate input into the production of product h. QS_{ih} is typically a meat supply quantity which enters into demand functions for feed products. PP_{ik} in the supply function represents substitution possibilities for the producer. TD_{ij} and TS_{ij} in the demand and supply functions account for policies or economic factors that might shift the functions over time.

Trade is the difference between domestic supply and total domestic demand (absorption). World markets clear when net trade of a product across all regions sums to zero:

$$\Sigma_i T_{ij} = \Sigma_i S_{ij} - \Sigma_i D_{ij} \qquad (3)$$

The policy structure is embedded in equations linking domestic and world prices. Domestic incentive prices depend on the levels of consumer and producer support (modeled in terms of consumer and producer support price wedges CSW_{ij} and PSW_{ij}), and on world prices denominated in local currency:

$$CP_{ij} = CSW_{ij} + F(E_i * WP_j) \qquad (4)$$

$$PP_{ij} = PSW_{ij} + G(E_i * WP_j) \qquad (5)$$

where E_i is the exchange rate of i with respect to the U.S. dollar, and WP_j is the world price of product j measured in U.S. dollars. Functional relationships F( ) and G( ) allow the transmission of world to domestic prices to be less than or equal to 1. If equal to 1, then 100 percent of a world price change is transmitted domestically. A value of less than 1 indicates that the government intervenes to cushion domestic producers and consumers from experiencing the full change, which in turn increases the level of price adjustment at the world level outside of the protected country. SWOPSIM convention defines subsidies (payments to producers or consumers) as positive numbers; negative subsidies or taxes are collections from consumers and producers.

Support of any type is captured by calculating its equivalent in two types of wedges. First, there is a market support wedge where a trade payment (tariff or subsidy) or trade quota creates a price wedge between domestic and world

prices. Second, there can be a direct payment wedge to producers or consumers which does not affect the observed market price but which is part of the domestic incentive price.

The SWOPSIM framework creates supply and demand equations with a constant elasticity form. The (constant) elasticities of feed demand are the shares of a product fed to produce a livestock product. Theoretical and practical constraints on model structure such as symmetry conditions or cross price relationships derived from duality theory are imposed on the elasticities actually used in the models (21,22).

SWOPSIM country models are initialized to a base year; that is, equation intercepts are calculated which fit each equation to base year parameters and data. A global model is then assembled where global trade for each product is balanced. This means that a global SWOPSIM model, before any external shock is administered, replicates the base data. Recalculating the spreadsheet to solve the model gives no change. This is the final test of the readiness of a SWOPSIM model.

Exogenous shocks are administered via changes in support wedges in price linkage equations ((4),(5)) or shifts in supply and demand equations ((1),(2)). Then, if a spreadsheet is recalculated, disequilibria caused by these shocks start a global model iterating to a new price-quantity balance where world markets for all products are again cleared.

After a global model solution has been obtained, several types of indicators can be calculated comparing the new equilibrium state to the base state. Standard Marshallian measures of producer and consumer surpluses and a host of other economic indicators are computed to study the economic welfare implications of policy changes (25,69,76).

Many of the augmentations to the SWOPSIM framework have relaxed some of the above characteristics and modified the economic structure of models. For example, Dixit and Roningen (7) modified the SWOPSIM framework to allow for bilateral trade flows using the Armington demand assumption. Similarly, Krissoff and Ballenger (39) relaxed the partial equilibrium assumption by including product aggregates defined to cover the whole economy and by examining agricultural and nonagricultural policy changes. Liapis (51) has added input sectors to agricultural product sectors to account for input markets in liberalization experiments.

The SWOPSIM framework leaves the user with models in spreadsheets, allowing the researcher flexibility in adapting the standard economic models to particular research needs, as evidenced by the variety of alternative modeling exercises cited in the references.

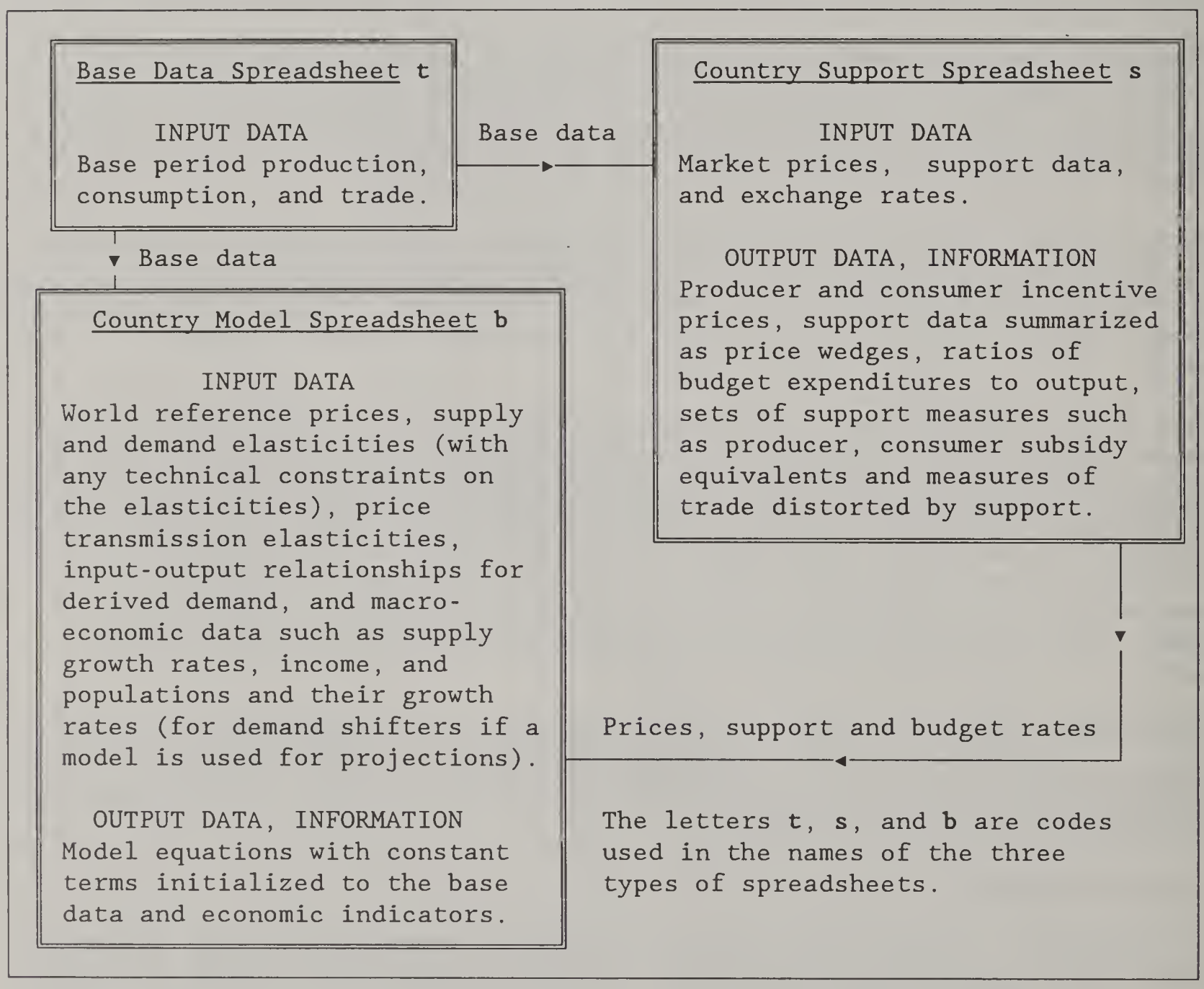
Data Requirements

The assembly of a consistent, global database is typically the most difficult part of any global modeling exercise. The SWOPSIM modeling framework allows the user to define model product and regional coverage. Data for a typical SWOPSIM country model requires information to be assembled into three spreadsheets distinguished by a small letter in the middle of the spreadsheet name: the country model spreadsheet (b), the base data spreadsheet (t), and the country support spreadsheet (s). Figure 2 gives a pictorial overview of these spreadsheets.

Several types of data for each commodity in each country are then required to construct standard SWOPSIM global models (69,70). These data items (and their home spreadsheet--codes **t**, **b** or **s**) are:

(1) Base year production, consumption, and trade quantity data (**t**).
(2) World reference prices (master model file), domestic prices (**s**).
(3) Policies summarized as price wedges (**s**).
(4) Supply and demand elasticities (**b**).
(5) Price transmission elasticities (**b**).
(6) Input-output relationships for derived demand (**b**).
(7) Technical constraints on elasticities (**b**).
(8) Exchange rates (**s**).
(9) Macroeconomic data such as supply growth rates, income, and population and their growth rates (for demand shifters if a model is used for projections) (**b**).

Figure 2--Spreadsheet data structure for a SWOPSIM country/region



Global models are typically built around existing global data sets. For SWOPSIM models at ERS, global supply, demand, and trade data for temperate zone products are obtained from the U.S. Department of Agriculture's Foreign Agricultural Service supply and utilization database (86). World price and exchange rate information are acquired from the International Monetary Fund (31), while domestic price and support data come from comprehensive studies of

support to agriculture for many countries in the world done by ERS (88,89) and the OECD (65).

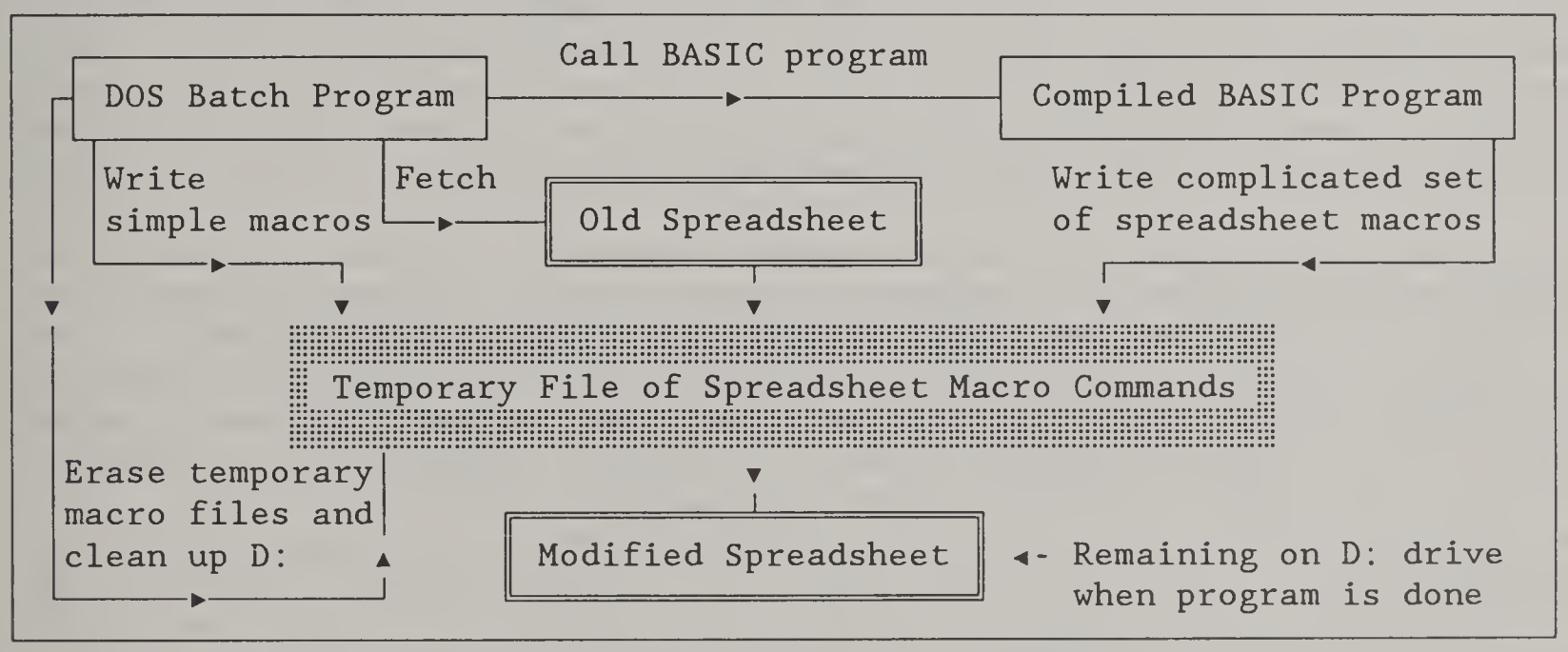
The creation of ERS SWOPSIM models has been accompanied by the assembly of several large data sets. The largest data set includes supply and utilization data for 22 commodities in 36 countries/regions for 1984 and 1986 (86). Many applications of the SWOPSIM framework to particular research questions have involved the aggregation of these 36 regions into a more aggregate world data set (e.g. 70,93). The SWOPSIM framework does have some aggregation routines which facilitate the aggregations of elasticity sets, support measures, and base data (76). The advantage of starting with a large balanced global data set is that aggregations are also globally balanced (i.e. world trade is balanced for each product in the base year).

Parameters for SWOPSIM models in ERS have typically been taken from existing sources. The own and cross price elasticity estimates for demand and supply and the technical coefficients are based on a host of empirical studies (13,83,86). Parameters are typically adjusted based on reasonableness of simulation results.

Computer Hardware and Software Requirements

The SWOPSIM framework runs on personal computers (PCs). SWOPSIM models and supporting data are maintained in spreadsheets on PCs and the framework helps the user to create and manipulate the spreadsheets. A typical SWOPSIM program sequence is shown in figure 3 where DOS batch programs and/or compiled BASIC programs write SuperCalc 5 macros which, in turn, perform spreadsheet operations.

Figure 3--A typical SWOPSIM program sequence operating on a spreadsheet



To carry out spreadsheet operations, the framework requires a specific configuration of a PC and requires storage space on a hard disk drive. The hardware requirements for the SWOPSIM framework and models partially depend upon the size (number of products and countries/regions) of models created. For a small model, the SWOPSIM framework typically requires an IBM or IBM compatible computer with about 4 megabytes (MB) available space on a C: hard drive and about 2 MB of random access memory (RAM).

SWOPSIM programs as well as model files are kept on the C: drive. Software must be installed that makes memory above 640 kilobytes (KB) available to the spreadsheet as "expanded" memory (some SWOPSIM operations use fairly large spreadsheets which require this feature). A D: drive of at least 1.4 MB is also required. D: may be a virtual drive or a partitioned part of a hard disk marked as the D: drive using the DOS SUBST command. The D: drive is used as the temporary storage place for all SWOPSIM input and output operations. When framework operations are completed, work must be saved manually to a model subdirectory on the C: drive. Larger SWOPSIM models (e.g. 20-30 countries and commodities) will require more expanded memory and more disk space.

Installation of the SWOPSIM framework requires that SuperCalc 5.0 (Computer Associates International Inc.) spreadsheet software and DOS 3.3 or a later version be installed on a PC.[5] The latest SWOPSIM version at ERS operates on the Revision D, 1989 version of SuperCalc 5.0 with a numeric coprocessor installed on the computer. Earlier versions of SWOPSIM operated with SuperCalc 3 and 4 which have been replaced by SuperCalc 5. The current version of SWOPSIM requires the 3-dimensional spreadsheet capability of SuperCalc 5. Specialized software such as QEMM must be installed (typically in the CONFIG.SYS file) to make PC memory above 640 KB available to SuperCalc 5 as expanded memory. Such software is often machine specific.

A laser printer is preferred for report writing because it is fast and allows the user to print a lot of information on one page. The report writers that come with the SWOPSIM framework are set for a laser printer used at ERS, but obviously non-ERS users are free to structure their report writing any way they want.

The SWOPSIM framework software comes on a 1.44 MB 3.5" or 1.2 MB 5.25" floppy disk as a self-installing program. SWOPSIM programs can be loaded from the floppy disk onto the C: (hard) drive by running SWOPINS A: from the A: disk drive (or SWOPINS B: from the B: drive). The READSWOP file on the disk contains detailed installation instructions. If the SWOPSIM programs are to be changed, then a BASIC interpreter and compiler are needed. The listings of SWOPSIM programs are contained in appendices to this document.

Three subdirectories are created in the C: drive by the SWOPINS program: SWOPSIM, BATCH, and DEMO. The SWOPSIM subdirectory has the compiled BASIC (all files with the .EXE extension) programs that carry out all SWOPSIM operations (they write spreadsheet macro commands). Microsoft BASRUN routines are needed on the C:\ drive (or root directory) to successfully operate the compiled BASIC (*.EXE) SWOPSIM programs. The BATCH subdirectory contains DOS batch programs which, in turn, control file manipulations, the execution of the BASIC macro-writing programs, and the execution of those macros in spreadsheets.

The disk containing the SWOPSIM software also has a self-installing demonstration (DEMO) model. When installed, the C:\DEMO subdirectory will have a 3-region, 22-commodity demonstration model of world agriculture built using the SWOPSIM framework. Steps in the creation of the DEMO model are illustrated later in this report. The installation process also installs two

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[5]SuperCalc is a registered trademark of Computer Associates International Inc., 1240 McKay Drive, San Jose, CA 95131, 408-432-1727.

computer tutorial programs, SWOPTUT and SWOPARM, which lead the learner through the construction and exercise of two small SWOPSIM models.

Problems for users of the SWOPSIM framework may be spreadsheet related (e.g. improper default settings on the spreadsheet), DOS related (e.g. the wrong DOS version), or model related (e.g. information entered in the wrong place or form in a model spreadsheet).

Options Available Within the SWOPSIM Modeling Framework

The reader should consult publications presenting analysis with SWOPSIM models to best understand what can be done with the framework. Typical ERS SWOPSIM models do not do everything; for example, they are not general equilibrium nor dynamic in nature. But they can provide proximate answers to a surprising variety of problems in economics. After all, the default models are simply a form of quantification of the basic tool of the economist, supply and demand analysis. Much of the usefulness of the framework lies its ability to facilitate sensitivity analysis and in its options for creating many varieties of model from the same data set.

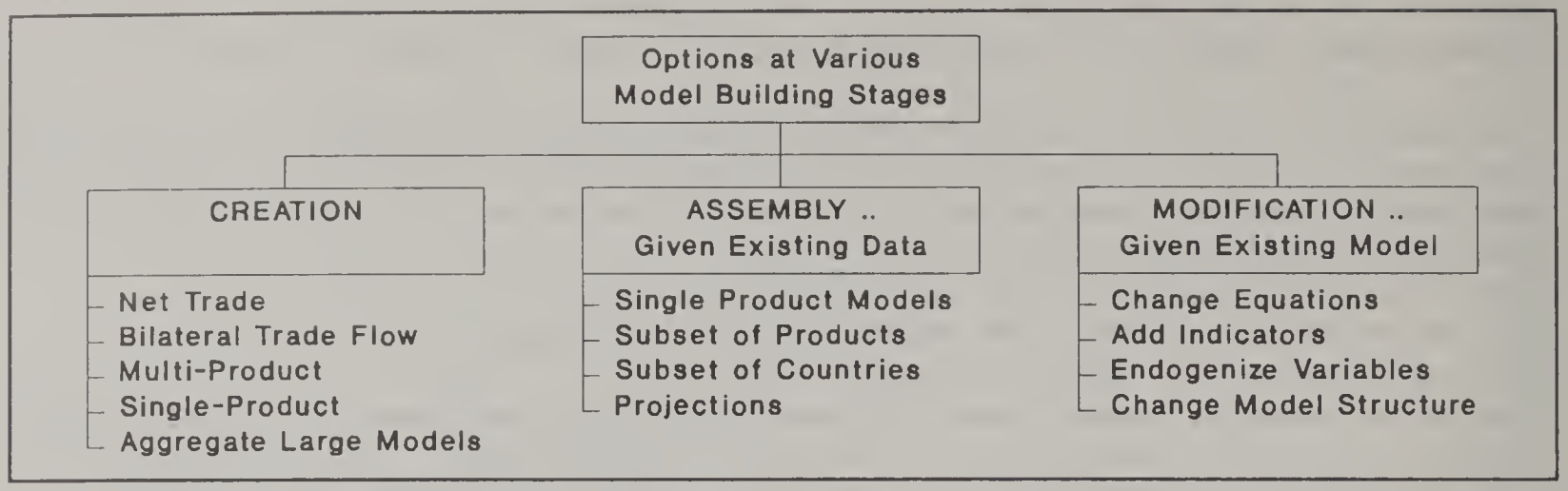
A good research/analytical strategy is to do sensitivity analysis with a base period model. Confidence in a model and judgement of the "reasonableness" of results is gained by simulating a model under a wide range of driving assumptions and model parameters. Sensitivity analysis can be easily done because the user can generate and save many types and varieties of models from the same data set. Also, given a particular model, many different solutions can be obtained by varying the shock applied to the model.

Some alternatives are easy to carry out, others require a systematic approach using components of the SWOPSIM framework. For example, if one is studying the effects of quantity shocks, this can be done directly without reinitializing the model; several solutions can be obtained by varying the level of shock and solving the same model. If, on the other hand, experiments require the alteration of elasticities or some other data that would change the equation constants, then modifications will have to be made in the country spreadsheet. New world models would have to be created from the modified data. In this case, the EQUATION program must be re-run to re-initialize the country spreadsheet where changes were made, and a new world model must be rebuilt. If base data are changed, the program WORK must be used to recalculate the support spreadsheet, SUPPORT must be used to update the model spreadsheet, and then EQUATION and WORLDMOD must be run. This latter type of alteration would result in different world models which could be simulated and compared to each other regarding their results.

The SWOPSIM modeling framework provides options to modify standard models to suit different research needs. It is also worth mentioning that sophisticated spreadsheet users, who program spreadsheet macros and DOS batch commands, have managed to change model equations and perform other operations without using some of the programs such as WORK, SUPPORT, and EQUATION. For users of the standard procedures, figure 4 outlines SWOPSIM options at various stages of the model building process.

Choices can be made at the model creation stage. Dixit and Roningen (7) altered the framework to allow for bilateral trade flows (6) between countries in their study of the U.S.-Canada free trade area (using the Armington assumption). This option is now available in the model creation process.

Figure 4--Typical SWOPSIM program operations on spreadsheets



Researchers can widen or narrow the focus of a model by defining the product coverage in the creation process. Krissoff and Ballenger (39) used the framework to incorporate a nonagricultural sector and studied the implications of agricultural policy changes under endogenous exchange rates. Mabbs-Zeno and Krissoff (54,55,56,57) used the basic framework to study liberalization in the tropical products market.

When country model spreadsheets have been created, supporting data have been entered, and model equations have been initialized, several options are available for the assembly of a world model. Single- or multiple-product world models can be assembled. In addition, world models can be assembled with subsets of the global product and country mix by selecting options that substitute fixed numbers for equations. This procedure, in effect, holds values of selected country and product variables constant in a world model simulation.

Finally, once country models have been created in spreadsheets or a world model has been assembled in a three-dimensional spreadsheet, contents of a spreadsheet can be modified manually by the user. Care must be taken not to subvert the functioning of a model, but the complete flexibility of the spreadsheet is generally available to the user for model modification. For example, several researchers have actually endogenized policy variables in SWOPSIM models rather than rely on fixed policy price wedges. Such endeavors are not too difficult if a user knows spreadsheet operations and willing to experiment a bit.

Because SWOPSIM models and data reside in spreadsheets, the framework and resulting models are very flexible and can be modified to suit various research needs. The only limitation is the imagination of the researcher.

Suggestions for Learning SWOPSIM

After reading the "overview" part of the documentation, the potential user may want to read one of the publications cited in the references using SWOPSIM. This gives a feeling for the type of problem solved with the SWOPSIM framework.

The installation disk has two tutorials which should be run. Appendix C shows most of the important computer screens seen when running the tutorials. The first tutorial, SWOPTUT, carries the user completely through the process of creating and exercising a small net trade world model (called SMAL). The second tutorial (SWOPARM) does the same thing for a little world bilateral trade flow (Armington type) model. These tutorials require the installation

of the SWOPSIM modeling framework on a computer. Once the tutorials are completed, the user then can examine the files created by the tutorials and/or repeat parts of the tutorials.

The installation disk contains a demonstration world model DEMO which covers 22 products and 3 regions of the world. It is a larger standard net trade model for user experimentation and learning. Exercising DEMO is the best way to hone SWOPSIM modeling skills.

The next logical sequence for many users is to design their own model for their own research purposes patterning it after DEMO or another existing SWOPSIM model cited in the references. Spreadsheet capabilities come in handy here since existing model files can be copied to new names and new coefficients and data can replace the old. This is a simple but effective way to re-tool an old SWOPSIM model to new uses.

SWOPSIM users will have to become familiar with the SuperCalc 5 spreadsheet. This can best be done with the reference manuals and tutorial that accompany the software.

Checklist for Dealing With Common SWOPSIM Problems

Experience with SWOPSIM dissemination around the world has yielded sets of typical problems. The framework has been adjusted to deal with many problems that have surfaced. However, it has not been convenient or possible to make the framework foolproof.

A potential user with problems can call the authors at 202-219-0630 or fax examples/descriptions of problems to 202-219-0942. A quick discussion can often spot and remedy a problem. It would be helpful, however, for the user to check the following list of suggestions for dealing with common problems before calling.

1. Type all SWOPSIM commands using CAPITAL LETTERS. Some of the programs will do unexpected things if lower case letters are used.

2. Invoke all SWOPSIM programs from the C: root directory. The SWOPSIM framework is designed around a particular computer and software configuration. The batch programs that control SWOPSIM operations assume that (1) SuperCalc 5 is on C:\SC5, (2) SWOPSIM programs are on C:\SWOPSIM, (3) batch controlling programs are on C:\BATCH, (4) temporary and output files will be put on D:, and (5) the programs BASERUN.EXE and BASERUN.LIB are on C: (see the SWOPSIM tutorials in Appendix C and the installations instructions in Appendix E).

3. The PATH command in the AUTOEXEC.BAT file should include the entries C:\;C:\BATCH;C:\SC5 as well as a reference to the subdirectory containing DOS commands. If the PATH command is incorrect, SWOPSIM files will not be found.

4. SuperCalc 5 must have the correct configuration. Set SuperCalc 5 defaults either by the automatic configuration invoked by the tutorials, or by executing the macro SETSC5.XQT as described by the file named SCRN4. Both files are in the SWOPSIM subdirectory (see Appendices D and F). An incorrect SuperCalc 5 configuration can give problems in model creation and output writing.

5. Use the SWOPSIM framework programs themselves as tutorials. All programs are self-documenting in that typing the name of the program (without the required inputs) results in a screen listing of the function of the program, the requirements for successful operation of the program, the form of output from the program, and the command syntax required. Many times when a program doesn't operate properly, it is because a file listed under the requirements section has not been properly prepared.

6. Care should be taken not to disturb the pattern of protected and unprotected cells in SWOPSIM SuperCalc spreadsheets. Protected cells generally contain formulas that are not meant to be overwritten, while unprotected cells can be filled with data by the user.

7. Take special care to run SWOPSIM programs in the correct sequence. For example, changes in data don't get incorporated into world models unless very specific sequences of programs are rerun. If you were to change the level of support in the policy support spreadsheet, you would need to run WORK, SUPPORT, and EQUATION before building a new WORLDMOD.

8. For output programs, there are broadly two sets of options. One set of output programs are utilized by the 22 commodity models that we have built for our work at ERS. This "standard" output option is the largest one and is designed around global databases prepared for SWOPSIM at ERS. The other smaller set of output programs is for models with more or less than 22 commodities. These "customized" output programs are provided for the many users who will build different type models, but they require more work on the part of the user than do the "standard" output routines. Specifically, customized spreadsheet templates must be constructed by the individual user. Also keep in mind that since global models and their country components are built in spreadsheets, the user can readily manipulate output with spreadsheet commands.

9. Following up on the last point, once the standard mode of SWOPSIM modeling has been mastered, the flexibility of the spreadsheet itself is there to exploit. The reference section contains many examples of alternative modeling exercises that modified standard SWOPSIM programs and spreadsheets to address particular research issues.

10. SWOPSIM framework programs have been debugged and extensively tested on ERS microcomputers (typically IBM compatible ATs and PS-2s, see the installation instructions in Appendix E). The disks sent to users work--on ERS computers--exactly as illustrated in this documentation. If you still have problems after using this list of possible problems, feel free to ask for help. Suggestions concerning the SWOPSIM framework are welcomed. Users' comments and suggestions have been at the core of SWOPSIM development and use over the years.

This part of the documentation presents the economic structure found in standard SWOPSIM models. Equations are presented from the small demonstration model SMAL that is created and exercised by the tutorial SWOPTUT (documented in Appendix C).[6] First, the equations are shown as they actually exist in the model, then they are discussed by equation group using more conventional notation, rather than the spreadsheet cell references used in SWOPSIM models.

SWOPSIM Model Equations in Spreadsheets

SWOPSIM models follow a convention for product and country nomenclature. Figure 5, the master model file for SMAL, defines the product and country stucture. The code definitions shown illustrate the nomenclature used in SWOPSIM models. The structure of SMAL was designed to illustrate the basic modeling options available for standard SWOPSIM models.

Figure 5--Master model file for SMAL

```
     |A||B||C||D||E||F||G||H|                                  | AP|| AQ|| AR ||AS|
 1   SMAL     Master model file for SMAL                              1989
 2
 3       US RW  -  -  -  -   Country Codes (B3:C3)                        WDPRICE
 4                           US - United States
 5    MT  D  D IU  .  .  .   RW - Rest of World                       MT  2050
 6    DM  D  D IB IN NT  .                                           DM   272
 7    DP  D  D IU OU  .  .   Matrix Codes (B5:C10)                    DP  2848
 8    CG  1  1  I  .  .  .   1 - Supply, demand equations created     CG   108
 9    OS  1  1  I IN  .  .   D - same as 1 but supply quantity can    OS   453
10    OM  D  D IB OU  .  .       be included in any demand equation   OM   227
11     ^  .  .  .  .  .  .   . - no equation
12                                                  Product Codes (D5:F10)
13   Product Codes (A5:A10)                         IU - Input Using
14   MT - MeaT (beef, pork, mutton, poultry)        I  - Input
15   DM - Dairy Milk (fluid non traded milk)        IB - I and IU Both
16   DP - traded Dairy Products (butter, cheese, powder)  IN - INput, int. dem.
17   CG - Coarse Grains (corn, other)               OU - OUtput, int. dem.
18   OS - OilSeeds (soybeans, other including rapeseed)   NT - Non-Traded
19   OM - OilMeals (soymeal, other meals)
```

Equations in SWOPSIM models use SuperCalc 5 math notation; an "*" means multiplication and "^" means exponentiation and the "+", "-", and "/" sign have the common meaning. As figure 5 shows, SWOPSIM models use two letters for country and product codes. The master model file defines the standard economic structure for SMAL that is created by the SWOPSIM CREATE command.[7,8]

After country model spreadsheets for SMAL have been created, and parameters and data have been entered, the user will have a spreadsheet such as the one shown in figure 6. Elasticity matrices are found at the top of the spreadsheet and model equation/information rows are at the bottom. Figure 6 shows part of the country model spreadsheet for the US for SMAL (SMALbUS).

---

[6] All of the variables and equations in a typical SWOPSIM model are listed in Appendix A. These include economic variables as well as indicators of various kinds.

[7] Standard options are those that can be chosen in the master model file. Since models are built in spreadsheets, nonstandard options can be inserted manually into spreadsheets after a standard model has been constructed.

[8] Comments added to the spreadsheets shown in the figures are underlined.

Figure 6--Part of US country model spreadsheet for SMAL

	A	B	C	D	E	F	G	H	I	J	K	L
1	SMALbUS	1989	XRATE-(LC/US$)		1	5/26/9		TRANSMISS.-ELAS.		1		INCGROW-
2												
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM	S-DSUM			
4	MT	.70	.01		-.11		-.03	.57	1.22			
5	DM	.02	.50		-.04		-.01	.47	.61			
6	DP		-.15	.43				.28	.89			
7	CG				.55	-.08		.47	1.34			
8	OS	Supply elasticity			-.18	.59		.41	.57			
9	OM	matrix				-.15	.20	.05	.89			
10												
11	DEMAND-EL	MT	DM	DP	CG	OS	OM	SMT	SDM	SDP	SOM	DEMSUM
12	MT	-.65										-.65
13	DM	.00	-.16	.02	Demand elasticity			Share elasticity		.58		-.14
14	DP	.00		-.61	matrix							-.61
15	CG	.00	.00	.00	-.88		.01	.65	.16			-.87
16	OS	.00	.00	.00	.00	-.31	.15				.92	-.16
17	OM	.00	.00	.00	.03		-.87	.90	.10			-.84
18												
19												
20	SMALbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND	NTRADECTRAN.EL		WDPT.EL	SSHIFT
21	MT	2050	1634	3057	1606	1	27972	28361	-389	1	1	.00
22	DM	272	301	595	216	1	65432	65432	0	1	1	.00
23	DP	2848	2938	3771	2111	1	3498	3406	92	1	1	.00
24	CG	108	115	99	89	1	221443	153953	67490	1	1	.00
25	OS	453	194	207	193	1	59339	42307	17032	1	1	.00
26	OM	227	171	214	171	1	26760	22606	4154	1	1	.00

Product equation/information rows (model equations in these rows are carried into world model)

Contents of selected elasticity matrix cells shown above:

	A	B	C	D	
1	"SMALbUS	1989	" XRATE-(LC/US$)->		
2					
3	"SUPPLY-EL	"MT	"DM	"DP	Notice that the bottom left half of the supply and demand elasticity matrices above contain formulas rather than numbers. These are symmetry formulas based on Slutsky conditions.
4	"MT	.7	.01		
5	"DM	C21*C4*G21/(C22*G22)	.5		
6	"DP		-.15	.43	
7	"CG				
8	"OS				
9	"OM				
10					
11	"DEMAND-EL	"MT	"DM	"DP	
12	"MT	-.65			
13	"DM	D21*C12*H21/(D22*H22)	-.16	.02	
14	"DP	D21*D12*H21/(D23*H23)		-.61	
15	"CG	D21*E12*H21/(D24*H24)	D22*E13*H22/(D24*H24)	D23*E14*H23/(D24*H24)	
16	"OS	D21*F12*H21/(D25*H25)	D22*F13*H22/(D25*H25)	D23*F14*H23/(D25*H25)	

The upper matrix contains supply elasticities; the lower matrix contains demand elasticities. The product rows (21:26) contain all of the model base data, equations, and economic indicators. The equation parts of these rows are moved to the world model when it is created. The bottom part of figure 6 shows the contents of selected cells containing elasticities in the SMALbUS spreadsheet. Notice that some of the cells contain numbers and others contain formulas (formulas and numerical constraints on numbers can be used to impose a structure on the elasticities used). Equations/formulas in the spreadsheets are made up of cell references and their inter-relationships. SWOPSIM models generally do not rely on range names in equations. This minimizes the storage size and maximizes the execution speed of models.

Actual model equations are contained in the product rows (fig. 7). Equations in the country model spreadsheets are made up of numbers (usually elasticities) and cell references. One equation may occupy several cells by referring to another cell for part of the equation. This is done to isolate parts of equations for certain operations; e.g., equation constants are

Figure 7--Equation cells their contents in the spreadsheet SMALbUS

	W	X	Y	Z	AA	AB	AC	AD	AE	AF
19										
20	LPRPRICE	LCNPRICE	SCROSS	DCROSS	SCONST	DCONST	SUPPLYEQ	DEMANDEQ	NTRADEEQ	TRADEOQ
21	MT 1633.847	3057.008	.5475295	1	287.7849	5225939.	27972	28361	-389	
22	DM 301	595.2176	.9144671	133.2835	4124.192	1364.463	65432	65432	-2.0e-10	0
23	DP 2938	3770.775	.3835294	1	294.2787	517448.7	3498	3406	92	
24	CG 114.6027	98.83912	.6560147	4832.766	24876.61	1814.387	221443	153953	67490	
25	OS 194.3482	207.4301	.4259365	25599.80	6219.176	8.637854	59339	42307	17032	
26	OM 171	213.7473	.4492305	34952.48	21301.87	68.82707	26760	22606	4154	

Contents of cells shown above:

	W	X	Y	Variable definitions
20	"LPRPRICE	"LCNPRICE	"SCROSS	
21	MAX(U21-N21+P21-Q21+T21*(F21*B21)^(J21*K21),1)+AF21	MAX(W21+N21+O21+V21,1)	1*X22^.01*X24^-.11*X26^-.03	LPRPRICE - Liberalized PRoducer incentive PRICE
22	MAX(U22-N22+P22-Q22+T22*(F22*B22)^(J22*K22),1)+AF22	MAX(W22+N22+O22+V22,1)	1*W21^.02*X24^-.04*X26^-.01	LCNPRICE - Liberalized CoNsumer incentive PRICE
23	MAX(U23-N23+P23-Q23+T23*(F23*B23)^(J23*K23),1)+AF23	MAX(W23+N23+O23+V23,1)	1*X22^-.15	SCROSS - Supply equation CROSS price term
24	MAX(U24-N24+P24-Q24+T24*(F24*B24)^(J24*K24),1)+AF24	MAX(W24+N24+O24+V24,1)	1*W25^Xx.08	DCROSS - Demand equation CROSS price term
25	MAX(U25-N25+P25-Q25+T25*(F25*B25)^(J25*K25),1)+AF25	MAX(W25+N25+O25+V25,1)	1*W24^-.18	SCONST - Supply equation CONSTant term (initialized to base data)
26	MAX(U26-N26+P26-Q26+T26*(F26*B26)^(J26*K26),1)+AF26	MAX(W26+N26+O26+V26,1)	1*X25^-.15	DCONST - Demand equation CONSTant term (initialized to base data)

	Z	AA	AB	
20	"DCROSS	"SCONST	"DCONST	SUPPLYEQ - SUPPLY EQuation
21	1	287.784882726605	5225939.13391239	
22	1*W23^.02*AC23^.58	4124.19205917094	1364.46308807748	DEMANDEQ - DEMAND EQuation
23	1	294.278745833074	517448.719849594	
24	1*X26^.01*AC21^.65*AC22^.16	24876.6081939262	1814.38668808267	TRADEOQ - Domestic market clearing (non-TRADEd, or trade = 0, product) eQuation
25	1*W26^.15*AC26^.92	6219.17570578484	8.63785374726528	
26	1*X24^.03*AC21^.9*AC22^.1	21301.8663009966	68.8270687525093	

	AC	AD	AE	AF
20	"SUPPLYEQ	"DEMANDEQ	"NTRADEEQ	"TRADEOQ
21	(1+L21+AJ1*AO21)*AA21*Y21*R21*W21^.7	(1+M21)*AB21*Z21*S21*X21^-.65	AC21-AD21	
22	(1+L22+AJ1*AO22)*AA22*Y22*R22*W22^.5	(1+M22)*AB22*Z22*S22*X22^-.16	AC22-AD22	IF(ITER=1,0,AF22-(W22*(AE22)/AC22))
23	(1+L23+AJ1*AO23)*AA23*Y23*R23*W23^.43	(1+M23)*AB23*Z23*S23*X23^-.61	AC23-AD23	
24	(1+L24+AJ1*AO24)*AA24*Y24*R24*W24^.55	(1+M24)*AB24*Z24*S24*X24^-.88	AC24-AD24	
25	(1+L25+AJ1*AO25)*AA25*Y25*R25*W25^.59	(1+M25)*AB25*Z25*S25*X25^-.31	AC25-AD25	
26	(1+L26+AJ1*AO26)*AA26*Y26*R26*W26^.2	(1+M26)*AB26*Z26*S26*X26^-.87	AC26-AD26	

located in separate cells so they can be easily re-calculated if data or equation parameters are changed. Figure 7 shows some spreadsheet cells from SMALbUS containing model equations followed by a listing of the contents of the cells showing the acutal numbers or equations contained therein. The variable definitions used in supply equations (from Appendix A) are:

SUPPLYEQ - liberalized SUPPLY EQuation quantity
SSHIFT - Supply SHIFT variable (representing an exogenous shift in supply)
LIBSHR - LIBeralization SHaRe (share of support removed in a liberalization scenario)
SETSIDE - SET-aSIDE shift variable (percentage increase in supply when set-asides removed and slippage accounted for)

SCONST - Supply equation CONSTant (calculated when model is initialized to base data)
SCROSS - Supply equation CROSS price term (cross price terms kept in this cell which is referred to in SUPPLYEQ)
SCROSSO - Supply equation CROSS price overflow term (an extra cell for cross price terms if equation has many of them)
LPRPRICE - Liberalized PRoducer incentive PRICE (price received by producer after liberalization, including remaining subsidies)

Cells W21:AF26 in SMALbUS contain the price linkage equations (LPRPRICE, LCNPRICE), equation constants (SCONST, DCONST), supply equations (SUPPLYEQ with reference to SCROSS), demand equations (DEMANDEQ with reference to DCROSS), net trade equations (NTRADEEQ), and market clearing mechanism for a nontraded product (TRADEOQ).

SWOPSIM equations are in a simple form for efficiency reasons. Spreadsheets are kept as small and simple as possible to conserve disk storage space and minimize calculation time.[9] Each product row in a model contains the same type of information. For example, column AC always contains supply equations with identical equation forms (with the exception that price terms which have an implicit elasticity of zero are omitted by SWOPSIM equation writing programs). Once the basic economics of these equations are understood, the model user can understand a particular country model by simply looking at the elasticity matrices.

The product rows in the country model spreadsheet, including model equations, stand alone when initialized. That is, the equations actually contain the elasticities which are obtained from the elasticity matrices by the model initialization process. This is an important feature because it allows the product rows containing the model features to be pulled out of the country model spreadsheet into a world model spreadsheet and operate independently.

The economic explanation of standard SWOPSIM equations will use a simple notation. The translation of the coarse grains (CG) supply equation from the spreadsheet equation to a simpler notation is described next via the SWOPSIM variable names used above spreadsheet columns (OS represents oilseeds).

Cell AC24 of SMALbUS contains the equation calculating the quantity of coarse grain (CG) supplied (fig. 7). This equation, as seen in the spreadsheet, is shown below, followed by a line where SWOPSIM variable names substitute for the equation's cell references.

```
    AC24    = (1+   L24    +   AJ1 *    AO24    )*   AA24    *    Y24    *     R24    *    W24    ^.55

SUPPLYEQ(CG) = (1+SSHIFT(CG)+(LIBSHR*SETSIDE(CG))*SCONST(CG)*SCROSS(CG)*SCROSSO(CG)*LPRPRICE(CG)^.55

               where      Y24     = 1*    W25     ^-.08

                      SCROSS(CG) = 1*LPRPRICE(OS)^-.08
```

---

[9] Spreadsheets have the capability to have equations written with variable names. However, the memory requirements for a SWOPSIM model would be much greater if this feature were to be used. Therefore equations remain written in the simplest spreadsheet cell notation. Appendix A lists an entire product row of equations and indicators replacing cell references with variable names. This allows the user to "read" the equations in terms of the variable names appearing over the spreadsheet columns.

For expositional purposes in this section of the report, this notation can be simplified. Let: QS, QD, QT = Quantity Supplied (SUPPLYEQ), Demanded (DEMANDEQ), Traded (NTRADEEQ); PP, PC = incentive Price for the Producer (LPRPRICE), Consumer(LCNPRICE), SHS, SHD = a shift share variable (SSHIFT+LIBSHR*SETSIDE for Supply, DSHIFT for Demand); and replacing constants with numbers; the supply equation for coarse grain (CG) becomes:

$$QS_{CG} = 24876.6 * (1+SHS_{CG}) * PP_{CG}^{.55} * PP_{OS}^{-.08}$$

This simplified notation, which also leaves out the exponentiation symbol, will be used to discuss the standard economic structure of SWOPSIM models.

Supply, Demand, and Net Trade Equations

Supply and demand quantities are functions of own and cross product prices and, if desired, other supply and demand quantities that are included in a model. Constant elasticity functional forms are used. Net trade is the difference between supply and demand.

The model SMAL contains equations for meat (MT), coarse grains (CG), and oilseeds (OS). Th supply, demand, and net trade equations for CG follow:

$$QS_{CG} = 24876.6 * (1+SHS_{CG}) * PP_{CG}^{.55} * PP_{OS}^{-.08} \quad (6)$$

$$QD_{CG} = 1814.4 * (1+SHD_{CG}) * PC_{CG}^{-.88} * PC_{OM}^{.01} * QS_{MT}^{.65} * QS_{DM}^{.16} \quad (7)$$

$$QT_{CG} = QS_{CG} - QD_{CG} \quad (8)$$

The constants (numbers) in equations (6) and (7) are calculated in the model initialization process so that the equations replicate the base period data. The shift factors can be exogenous numbers or complex formulas.[10]

Derived Demand Relationships

Standard SWOPSIM equations can have derived demand relationships. The demand equation for coarse grains (7) specifies that coarse grain demand is a function of the quantity of meat (MT) and milk (DM) produced where the elasticities are the quantity share of coarse grains fed to meat and dairy animals (0.65 and 0.16, respectively). This specification says that if relative prices of coarse grains and oilseed meals (OM) do not change, the feeding ratio of coarse grains to meat and milk animals will remain the same. If meat production doubles, coarse grains fed to meat animals will double.

In addition to direct quantity effects in derived feed demand, own and cross price driven subsitution between the product and alternative input products are added to direct effects. This means that if the price of an alternative feed input becomes cheaper, relatively more of it will be used, thus, offsetting some of the direct effects that might occur. This specification simplifies feed demand by assuming the same rate of substitution between feeds

---

[10] For example, SWOPSIM models have been made into projection models by making the supply shift variable a function of a growth term and the demand shift variable a function of projected income and population growth which drives per capita demand for a product.

in response to price across animal products, while allowing for different initial feed mixes.

This same derived demand relationship is used for other products as well, such as the demand for dairy milk (DM) from the manufacture of dairy milk products (DP) and the demand for oilseeds (OS) from the crushing of oilseeds for oils and meals (OM). These specifications are shown in equations (9) and (10) (where, for milk, -.16 and .02 are own and cross price elasticites and .58 is the share of milk going to milk products; and for oilseeds, .92 is the share of oilseeds crushed).

$$QD_{DM} = 1364.5 * (1+SHD_{DM}) * PC_{DM}^{-.16} * PP_{DP}^{.02} * QS_{DP}^{.58} \quad (9)$$

$$QD_{OS} = 8.7 * (1+SHD_{OS}) * PC_{OS}^{-.31} * PP_{OM}^{.15} * QS_{OM}^{.92} \quad (10)$$

The Imposition of Conditions on Systems of Equations

A SWOPSIM model is synthetic; that is, elasticities and parameters are typically borrowed from other work. An advantage of synthetic models is that thoretical or practical conditions can be imposed on the elasticities. Figure 6 shows an example of formula based relationships where symmetry formulas calculate the elasticities in the bottom half of the elasticity matrices from the elasticities in the top right half, and base quantity and price data.[11]

Numbers themselves can be selected to maintain an overall model structure. A practice often followed is to target the row sums of elasticities (columns H and L in figure 6). A model will be well behaved if the row sums of the own and cross price elasticities are positive on the supply side and negative on the demand side.

The Armington Demand Option for Bilateral Trade Flows

An Armington model distinguishes products by country of origin in a demand system (6,24). Figure 8 shows part of the demand matrix and cell contents for an Armington demand system from the model LARM, which is generated by the SWOPARM tutorial (Appendix C). The US demand equation for coarse grains from the rest of the world (RWCG) in the US country model spreadsheet for LARM (cell F17) is:

$$QD_{RWCG} = 16.7 * P_{USCG}^{2.09} * P_{RWCG}^{-2.97} * QS_{MT}^{.65} * QS_{DM}^{.16} \quad (11)$$

where, for example, the number 2.09 (the cross price elasticity of demand for RWCG in the US with respect to the price of US coarse grains-USCG) is from the Armington formula, .99 * (3-.88) in cell F17. .99 is the share of US-produced coarse grains of all coarse grains consumed in the US. The number 3 is the

---

[11] If other relations between elasticities are known, formulas can be entered in the top right half of the elasticity matrices as well. The model DEMO in Appendix B has some formulas for elasticities relating feed costs to meat supply output, dairy product production to milk production, and oilseed product production to oilseed demand. In some cases, such as milk demand, a demand elasticity is actually a composite formula including an effect for both the consumption and manufacturing demand for milk. The main lesson is that although the standard economic structure appears simple, much complexity can lie behind that structure, implicitly or explicitly.

Figure 8--Part of Armington model spreadsheet LARMbUS

	A	B	C	D	E	F	G	H	I	J	K	L	O	P	Q	R	S	T
10	LARMbUS									S-	S-	DEM	FLD	FLD	VD	D	OWN	ELAS
11	DEMAND	MT	DM	USDP	RWDP	USCG	RWCG	SMT	SDM	USDP	RWDP	SUM	SHR	ELAS	SUM	SHR	PE	SUBS
12	MT	-.65										-.65						
13	DM	.00	-.16	.02						.58		-.14	.42	-.20				
14	USDP ◄	.00		-.70	.09	Armington						-.61			1.2e7	.96	-.61	3
15	RWDP ◄	.00		2.30	-2.91	elasticities						-.61	1.00			.04		3
16	USCG ◄	.00	.00	.00	.00	-.91	.03	.65	.16			-.88	.19		1.1e7	.99	-.88	3
17	RWCG ◄	.00	.00	.00	.00	2.09	-2.97	.65	.16			-.88	.19			.01		3

Armington nomenclature

Formulas use these elasticities and data to calculate these elasticities

	F	G
	"USCG	"RWCG
16	-(1-R16)*T16+R16*S16	R17*(T16+S16)
17	R16*(T17+S16)	-(1-R17)*T17+R17*S16

For CG, the own and cross price elasticities for the Armington products (USCG and RWCG) are calculated by formulas depending upon the own price elasticity for CG, the elasticity of substitution between imported (RWCG) and domestic (USCG) in the US, and relative shares of USCG and RWCG in US consumption. The formulas calculate the elasticities which are then used by the model in the normal way.

coarse grains of all coarse grains consumed in the US. The number 3 is the elasticity of substitution between USCG and RWCG in the demand for CG, while -.88 is the own price demand elasticity for CG in the US. The number -2.97 is from the formula -(1-.01) * 3 + .01 * (-.88) in cell E17. The elasticities of substitution do not have to be the same between Armington products (e.g. cells T16 and T17 in figure 8 could have different numbers).

SWOPSIM emulates the Armington approach by using Armington formulas containing demand shares, overall own price demand elasticities, and elasticities of substitution between domestic and imported products to calculate the own and cross price elasticities of demand for Armington products. Once calculated, they are used directly in SWOPSIM demand equations. These own and cross price elasticities derived from Armington formulas are often large. Care has to be taken to solve such a model since demand swings can be quite substantial, given a small price change.[12]

The Standard Policy Structure

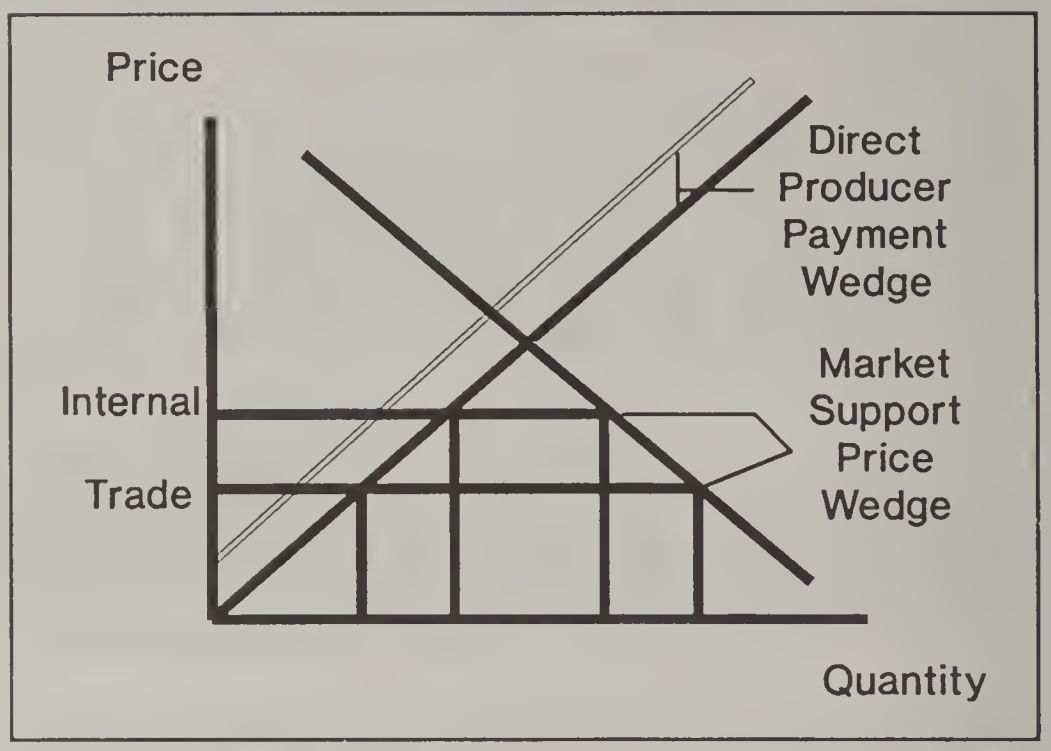
Policy information in standard SWOPSIM models is parameterized as a price wedge. Price wedges are derived from information used to calculate producer subsidy equivalents (PSEs). These calculations assume perfect substitutability between domestic and trade products.

Price wedges may be caused by market support policies which raises the domestic price above the trade price. Market support can derive from an import tariff, an export subsidy, or a trade quota. In addition to market support, there may be direct payments to producers or consumers which add another price wedge between the domestic market price and the actual price relevant to the producer or consumer (the incentive price).

In figure 9, the domestic price is above the border price because of market support by a tariff. In addition, a direct producer payment has caused movement along the supply schedule (to the right) but has been offset by production controls (supply curve shifted to the left showing the direct

[12] The only practical limit on the size of elasticities in the SWOPSIM framework is that the equation writer limits them to 5 digits (between -9.99 and 99.99).

Figure 9--Price wedges from market support and direct producer payments



support wedges sum to give the producer incentive price wedge. This simple figure illustrates the economics behind the PSE and the price wedges used in SWOPSIM models. A typical SWOPSIM model will be initialized with market prices (internal) and quantities that include the shift effects of policies associated with direct payments. The market support part of a price wedge defines the trade price in figure 9, given an internal market price.

Any policy regime in place may be institutionally and operationally complex, but under the assumptions used for PSE's, all support can be be translated to a wedge representing market support and/or direct payments.[13]

Price wedges are calculated in the country support spreadsheet and carried into the country model spreadsheet by the program SUPPORT. If market support is provided by a tariff or export subsidy, it is carried into a variable market either as an import or export subsidy (subsidy is defined as a positive number, tax or tariff as a negative number). Direct payments or market support from a trade quota are carried into the model as a producer price wedge and a consumer price wedge.

For agricultural products, there may be supply control policies which directly restrain production. These are represented by set-aside estimates of how much production is prevented by the controls (29).

For some situations, it is also desirable to limit the amount of external price change feeding into a domestic market. This is accomplished by including a price transmission elasticity term in equations linking domestic and trade prices. The price transmission term has often been used in a global market to limit world price transmissions into planned economies, which implicitly endogenizes price wedge behavior.

Price Linkage Equations

Policies represented as price wedges appear in price linkage equations which connect domestic prices to world prices. The domestic prices modeled are the producer and consumer incentive prices (LPRPRICE and LCNPRICE). Figure 10 shows part of SMALbUS containing price linkage equations and the equations in two cells.

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[13] Policy levels can be endogenous, that is, they may respond to world price changes. One way of handling this problem in a SWOPSIM model spreadsheet is to replace a number in a price wedge cell with a formula relating it to a world price and an internal "target" price.

Figure 10--Price linkage equations in SMALbUS

	A	B	F	J	K	N	O	P	Q	T	U	V	W	X
20		WDPRICE	XRATE	CTRAN.EL	WDPT.EL	PRSUBW	CNSUBW	IMSUBW	EXSUBW	TDCONST	PRCONST	CNCONST	LPRPRICE	LCNPRICE
21	MT	2050	1	1	1					.783368	27.9431	1423.16	1633.847	3057.008
22	DM	272	1	1	1					.795113	84.7292	294.218	301	595.2176
23	DP	2848	1	1	1					.741207	827.044	832.775	2938	3770.775
24	CG	108	1	1	1					.824074	25.6027	-15.764	114.6027	98.83912
25	OS	453	1	1	1					.426049	1.34819	13.0819	194.3482	207.4301
26	OM	227	1	1	1					.753304	0	42.7473	171	213.7473

Price linkage equations in cells W21:X21

	W	X
20	"LPRPRICE	"LCNPRICE
21	MAX(U21-N21+P21-Q21+T21*(F21*B21)^(J21*K21),1)+AF21	MAX(W21+N21+O21+V21,1)

The price linkage equations are designed for the removal of policy price wedges. Existing price wedges are removed, in effect moving the actors along their supply and demand schedules, causing a global trade disequilibrium. The model then iterates world prices to find a new global equilibrium.

The price wedges are calculated in the country support worksheet and carried into a model spreadsheet in four forms: a producer subsidy wedge (PW), a consumer subsidy wedge (CW), an import subsidy wedge (IW), and an export subsidy wedge (EW). These variables are PRSUBW, CNSUBW, IMSUBW, and EXSUBW, respectively, in figure 10. Letting WP denote the world price (WDPRICE in figure 10), CT the country price transmission elasticity (CTRAN.EL), CW the world price transmission elasticity (WDPT.EL), NW the price wedge from clearing the market for the nontraded product (TRADE0Q), and replacing constants with numbers, the equation for the producer incentive price (LPRPRICE) for coarse grain (CG) in SMALbUS becomes:

$$PP_{CG} = MAX\{[27.9 - PW_{CG} + IW_{CG} - EW_{CG} + (1 * WPCG)^{(CT*CW_{CG})}],1\} + NW_{CG} \quad (12)$$

In this equation, the producer incentive price is recalculated when variables representing the various price wedge components are given values to be removed. The equation also has a programming element in that the MAX choice prevents a price of less than 1 from ever being calculated, since negative prices would make no sense. This eliminates the problem that could arise in trying to exponentiate a negative price if one were calculated during the solution process. The price wedge added for a nontraded product (NW) will exist only when a product is nontraded (discussed in a later section).[14]

Ignoring the programming elements, this price linkage equation simply says that if a producer subsidy, an import tax, or an export subsidy is removed, the producer instantaneously receives less per unit output. This shock would cause the producer to produce less and the model to iterate to a new equilibrium.

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[14] This illustrates an important point about standard SWOPSIM models in particular and spreadsheet models in general. From a programming viewpoint, it is easier to always insert a variable in an equation even if it only exists (has a non-zero value) occasionally. If a variable such as NW refers to a cell which is blank, the spreadsheet will return a value of zero for that variable. This illustrates the second point that the operation of a spreadsheet model relies on the default conventions of the spreadsheet itself. This avoids excessive programming.

The equation allows for two price transmission elasticities. CT is pegged to a country transmission elasticity; changing one number changes CT for all products in a model. CW allows a different price transmission elasticity to be used for each commodity.[15] A price transmission elasticity of less than 1 allows only part of any world price change to feed back in to the producer price.

The constant term (27.9) is calculated by an initialization program (EQUATION) as the difference between the producer incentive price and the trade price (the price at the border that would prevail without support to the domestic market). This incorporates the effects of policy distortions and marketing margins. Liberalization removes the policy distortion portion and leaves marketing margins in place, since SWOPSIM assumes fixed marketing margins.

There also is an operating rule for SWOPSIM net trade models that a country is either a net exporter or a net importer of a product. Market support as a trade subsidy is applied to either the export or import side (IW or EW), but not both. This means that although IW and EW both appear in the price linkage equation, only one of them will have a nonzero value.

The second price linkage equation connects the consumer incentive price (PC) for coarse grain to the producer incentive price.

$$PC_{CG} = MAX\{[1423.2 + PP_{CG} + PW_{CG} + CW_{CG}], 1\} \qquad (13)$$

Again, the MAX programming mechanism prevents zero and negative prices. The equation simply says that if direct payments to producers and consumers are removed, the consumer would instantly have to pay more for the product. This price shock would then iterate through the model until a new equilibrium point was reached.

Equations (12) and (13) constitute the standard price linkages between domestic and world prices in a SWOPSIM model.[16] The essence of the price linkage equations is that policy price wedges representing various kinds of subsidies are subtracted from the producer and consumer incentive prices. World price effects can be limited too by selecting price transmission elasticities of less than one. This can be done for a country as a whole or for individual products. Nonstandard price linkages can be entered by various means, such as endogenizing policy variables.

Nontraded Products

SWOPSIM allows for the designation of products as nontraded. This means that a separate mechanism is created for clearing the domestic market if a model is

---

[15] This illustrates another style used when creating SWOPSIM models in spreadsheets. More than one variable is often used to perform an identical function in an equation. In this case, it is convenient to have the option of assigning a uniform country price transmission elasticity as well as having the option of specific product related ones. Care has to be taken that both are not used mistakenly.

[16] Alternative world price transmission specifications could be done by manually changing the default specification or by more imaginative schemes such as endogenizing policy price wedges.

shocked. The mechanism (in column AF) of the country model spreadsheet simply calculates a negative price wedge if the country is a net exporter and a positive one if it is a net importer. This is the variable NW in the equation (12). In SMALbUS, fluid milk (DM) is treated as a nontraded good because fluid milk is perishable and usually not traded as a fluid over long distances. The decision to treat a product as nontraded is a judgment call for the modeler.

World Market Clearing Mechanism

When a SWOPSIM world model is correctly assembled, it is in a balanced state. That is, world markets are all cleared (world net trade is zero) and world supply equals world demand. The balanced model is then shocked by an exogenous intercept shift of the supply or demand schedules or by removing a price wedge by putting it in a variable, which enters a price linkage equation. The unbalanced world model begins to iterate.

World markets are cleared for each product by summing up world net trade and (raising/lowering) the world price if world net trade is (negative/positive). This new world price is fed back into the country models though the price linkage equation (12) and new country quantities are calculated. This process repeats until a new adjusted world equilibrium with zero world net trade for all products is achieved.

Figure 11 shows the world market clearing mechanism on page 1 of the spreadsheet SMALWD. The top part shows the cells while the bottom part of the

Figure 11--World market clearing mechanism on page 1 of the world model SMALWD

	AB	AC	AD	AE	AG	AH	AJ	AK	
20	SMALWD	SUPDEMB	BWDPRICE	WDTRADE	WEIGHT	LWDPRICE	WDPRICED	WDPRICE%	Page 1 of SWOPSIM
21	MT	150076	2050	0	.8	2050	0	.00	world model
22	DM	440249	272	0	0	272	0	.00	SMALbUS with the
23	DP	21236	2848	0	.8	2848	0	.00	world market
24	CG	800233	108	0	.8	108	0	.00	clearing mechanism.
25	OS	211413	453	0	.8	453	0	.00	
26	OM	116823	227	0	.8	227	0	.00	

Contents of above cells

Weights used to dampen movements in world prices from world market clearing formulas.

1	AB	AC	AD	AE	AG
20	"SMALWD	"SUPDEMB	"BWDPRICE	"WDTRADE	"WEIGHT
21	"MT	150076	2050	SUM(2:3!AE21)	.8
22	"DM	440249	272	SUM(2:3!AE22)	0
23	"DP	21236	2848	SUM(2:3!AE23)	.8
24	"CG	800233	108	SUM(2:3!AE24)	.8
25	"OS	211413	453	SUM(2:3!AE25)	.8
26	"OM	116823	227	SUM(2:3!AE26)	.8

Formulas reach into country pages to world model spread-sheet to sum world net trade.

1	AH	AI	AJ	AK
20	"LWDPRICE		"WDPRICED	"WDPRICE%
21	B21*(1-AG21*AE21/(AC21+10))		AH21-AD21	(AH21-AD21)*100/AD21
22	B22*(1-AG22*AE22/(AC22+10))		AH22-AD22	(AH22-AD22)*100/AD22
23	B23*(1-AG23*AE23/(AC23+10))		AH23-AD23	(AH23-AD23)*100/AD23
24	B24*(1-AG24*AE24/(AC24+10))		AH24-AD24	(AH24-AD24)*100/AD24
25	B25*(1-AG25*AE25/(AC25+10))		AH25-AD25	(AH25-AD25)*100/AD25
26	B26*(1-AG26*AE26/(AC26+10))		AH26-AD26	(AH26-AD26)*100/AD26

figure shows the content of the cells. The key calculation is in column AH where the old world price (in column B) is multiplied by one minus the ratio of the net trade relative to base world supply (= base world demand). Because

this adjustment to the world price is a crude estimate (in the right direction), the user can adjust it with a damping factor in column AG.

Economic Welfare Calculations

Standard Marshallian measures of producer and consumer surplus are used to evaluate the economic welfare implications of policy and other exogenous changes. The total change in welfare for a product is defined as the change in producer surplus plus the change in consumer surplus plus the change in government revenue associated with the policy or other changes plus changes in economic rent associated with quota policies.

Producer and consumer surplus calculations rely on the base equilibrium and new equilibrium quantity and price data and supply and demand elasticities. The surplus calculations for constant elasticity functions are obtained by integrating under the supply and demand functions and evaluating the integral between price bounds. The technical details are presented in Appendix D. Other publications discuss some of the difficult problems in calculating and interpreting economic welfare measures in a partial equilibrium model (25).

Much of the indicator information in SWOPSIM models is related to welfare calculations. For example, the calculation of changes in government revenue/expenditures as policies change requires information on budget expenditure rates, and gross trade if trade taxes are operative. The information requirements for welfare calculations are one reason why the country support spreadsheets are complex.

The country support spreadsheet, besides calculating the price wedges (measuring support levels) that shift supply and demand schedules, also calculates budget wedges associated with producer, consumer, and trade support. These budget wedges are carried into the model spreadsheets by the SUPPORT program and they are used, in turn, to estimate changes in government revenue from liberalization as well as changes in new government revenue from policies remaining in place but operating on new supply, demand, and trade quantities.

The support spreadsheet tags policies as to whether or not they are associated with goverment revenues or expenditures. For example, an import tariff provides market support and collects revenue from imports. If the tariff is lowered, less revenue is collected on existing imports but imports may increase, increasing the revenues collected with the lower tariff. The calculation of this change in government revenue requires the old and new tariff rate (import budget price wedge in SWOPSIM jargon) as well as the old and new import level. Although SWOPSIM models are defined on a net trade basis, gross exports and imports are included in the base data, support spreadsheets, and model spreadsheets so that this type of calculation can be carried out.

Appendix A gives a complete list of SWOPSIM variables and their explanatory equations. Most of the indicator variables are related, one way or another, to welfare calculations. A list of variables used in welfare calculations follows along with a list of their equations. The main welfare equation is underlined and all of the direct-welfare equations are in **bold** type.

```
Variable    Equation Calculating the Variable

SUPPLYD    = SUPPLYEQ-SUPPLY
DEMANDD    = DEMANDEQ-DEMAND
NTRADED    = NTRADEEQ-NTRADE
PSURPLUS   = (.001/(1.6*XRATE))*(LPRPRICE*SUPPLYEQ-((PRPRICE+LSHRPSW*PTAXE)*SUPPLY))
             +LSHRPSW*.001*PTAXE*SUPPLY/XRATE
CSURPLUS   = (-.001/(.3*XRATE))*(LCNPRICE*DEMANDEQ-(CNPRICE*DEMAND)-((MAX(CNPRICE,LCNPRICE))^.3)
             *((DEMANDEQ/(LCNPRICE^-.7))-(DEMAND/(CNPRICE^-.7))))
GOVTEXPD   = -.001*(LSHRPSE*PBSE*SUPPLY+LSHRCSW*CBSE*DEMAND+LSHRMSQ*MBSE*BGRIMP+LSHRESW*EBSE*BGREXP)
NEWGEXPD   = .001*((1-LSHRPSW)*PBSE*SUPPLYD+(1-LSHRCSW)*CBSE*DEMANDD+(1-LSHRMSW)*(MBSE*GRIMPD)+(1-LSHRESW)
             *(EBSE*GREXPD))+EXTREVC
WELFARE    = MPSURPLS+CSURPLUS-GOVTEXPD-NEWGEXPD+CQRENT
CQRENT     = (((1-CTRAN.EL*WDPT.EL)*(WDPRICE-BWDPRICE)+(1-LSHRCSW)*(CSW-CBSE)
             *IF((NTRADEEQ/(NTRADE+.001))<0,0,1))*.001*NTRADEEQ)-BQRENT
MPSURPLUS  = PSURPLUS-(.001/(1.6*XRATE))*((.5*MIN(PPRMAT,LPRPRICE))^1.6)*((SUPPLYEQ/(LPRPRICE^.6))
             -(SUPPLY/(PPRMAT^.6)))
LSHRPSW    = PRSUBW/(DPSW+.00001)
LSHRCSW    = CNSUBW/(CSW+.00001)
LSHRMSW    = IMSUBW/(MSW+.00001)
LSHRESW    = EXSUBW/(ESW+.00001)
LGREXP     = MAX(BGREXP+NTRADED*((BGREXP+.5)/(BGREXP+BGRIMP+1)),0)-MIN(BGRIMP
             -NTRADED*(BGRIMP+.5)/(BGREXP+BGRIMP+1),0)
LGRIMP     = MAX(BGRIMP-NTRADED*((BGRIMP+.5)/(BGREXP+BGRIMP+1)),0)
             -MIN(BGREXP+NTRADED*(BGREXP+.5)/(BGREXP+BGRIMP+1),0)
GREXPD     = LGREXP-BGREXP
GRIMPD     = LGRIMP-BGRIMP
GREXP%     = (LGREXP-BGREXP)*100/(BGREXP+1)
GRIMP%     = (LGRIMP-BGRIMP)*100/(BGRIMP+1)
BDEMPC     = 1000*DEMAND/(1+POPULATION)
LDEMPC     = 1000*DEMANDEQ/(1+(POPULATION*((1+P1)^AG1)))
PSUPPRT    = .001*SUPPLYEQ*((1-LSHRPSW)*DPSW-(1-LSHRMSW)*MSW+(1-LSHRESW)*ESW)
PPRMAT     = PRPRICE+LSHRPSW*PTAXE
```

The user can read the welfare equations in SWOPSIM models in terms of the variable names above the columns. A few comments are in order. First, surplus calculations as derived in Appendix D depend upon elasticities that appear in equations as numbers rather than cell references to elasticity matrices. This is similar to the situation for SWOPSIM model equations. Second, the surplus calculations have to be programmed to work when prices go up as well as down, hence terms like MAX appear in the calculations. Third, as mentioned above, producer surplus changes are not considered when prices drop beyond a certain point. All of these practical considerations make the welfare calculations more complicated and less precise.

Quota rent changes are also a problem in welfare calculations, since the model does not explicity say who receives them. The implicit assumption is that they are received by someone in the country originating the policy (such as an importer).

A final ambiquity is the calculation of changes in gross trade used in government revenue changes associated with trade tariffs and subsidies. While the base quantities of gross exports and imports are included, the model calculates only a change in net exports (the change in gross exports minus the change in gross imports). An approximation formula relating gross trade changes to net trade changes produced by the model is used. This approximation is best when net trade consists mostly of exports or imports, but is less certain when considerable exports and imports exist.[17]

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[17] An alternative would have been to directly relate the policy changes on the export or import side to the gross export or import trade change.

Other Economic Indicators

The remaining few economic indicators can be be examined in detail in Appendix A. Most of them are calculated differences or percentage differences in base and new equilibrium variables that help the user tell the story of the modeling simulation.

In addition, there are base and new self-sufficiency ratios and per capita demand numbers. These indicators serve as checks on the model data and are particularly useful in giving a sense of the "realism" of model results if the projections mode of the model were used.

Illustration of the Mechanics of the SWOPSIM Modeling Framework

The SWOPSIM framework is a set of programs that automate the construction of models in spreadsheets. This section illustrates the use of the framework to build a demonstration model DEMO which is fully documented in Appendix B.

The SWOPSIM model building process is summarized in the flowchart on the following page.[18] There are a number of procedures that need to be undertaken to create a SWOPSIM world model, if normal procedures are followed. These include making a model subdirectory, establishing a master model file, constructing country base data spreadsheets, creating policy support spreadsheets, constructing country spreadsheets, and generating a world model. An illustrated explanation of the framework follows, emphasizing important operations shown in the flowchart.

It is possible for an experienced SWOPSIM and spreadsheet user to avoid the used of the support spreadsheet (an **s** file) altogether. It would require that some batch programs be modified and that user written spreadsheet macro programs or manual spreadsheet operations be used to insert support information into the country model (a **b** file) spreadsheet. New users are strongly advised to follow normal procedures and experienced users may find them very helpful at best, and a minor nuisance at worst.

The Normal Flow of Operations in the SWOPSIM Framework

SWOPSIM models and data are contained in spreadsheets. SWOPSIM programs carry out operations upon spreadsheets to collect data, write equations, and store the new information in spreadsheets. Until a program is run, spreadsheets for a model are all stored on a model subdirectory on the C: drive. In the case of the DEMO demonstration model used in this report, the spreadsheets are contained in the C:\DEMO subdirectory.

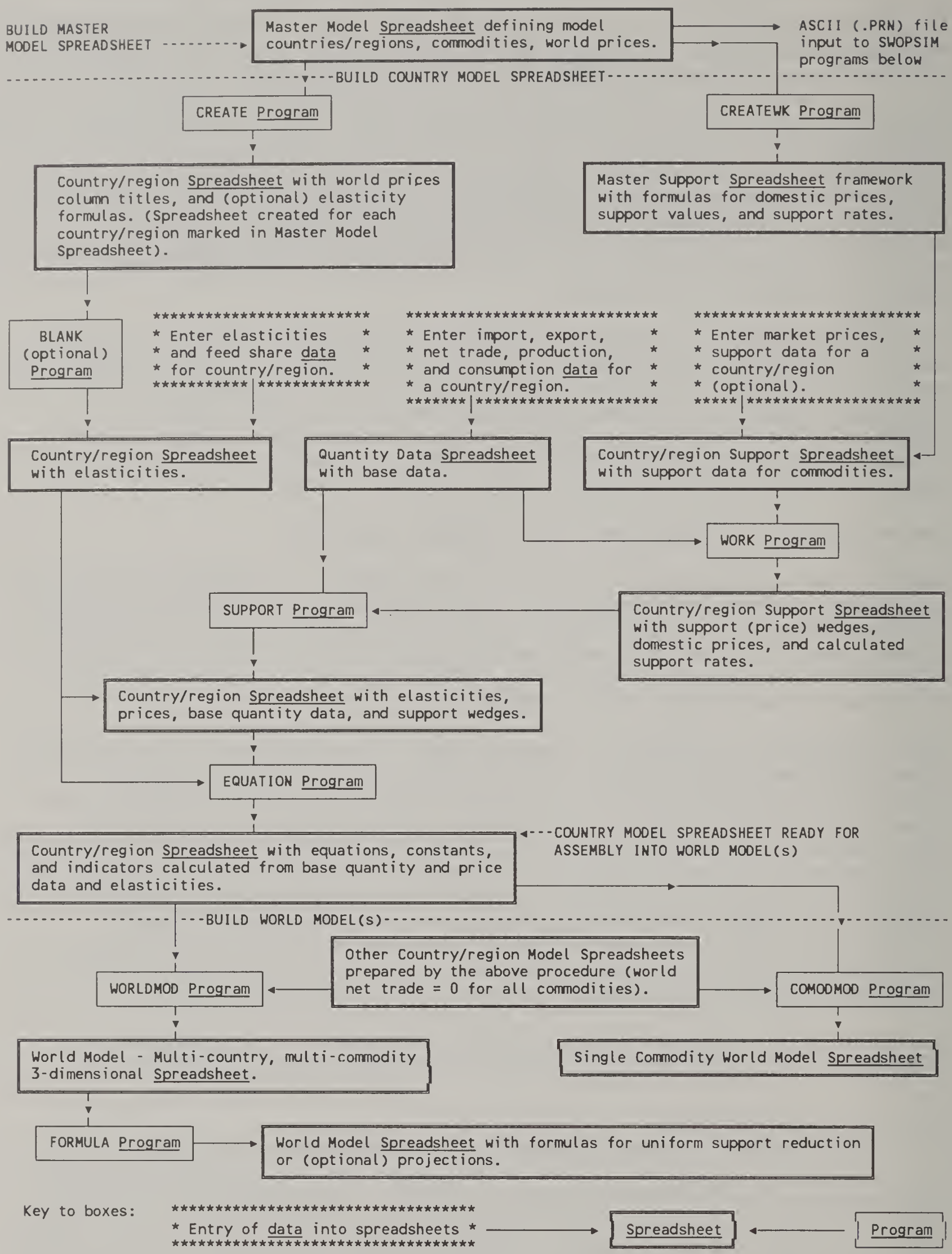
When a program is invoked to perform a task, the spreadsheets to be operated upon are automatically copied to the D: drive by a DOS batch program. Compiled BASIC programs (or in some cases, DOS batch programs) are run which create spreadsheet macros to carry out the tasks within the spreadsheets. When completed, spreadsheets and other temporary files that are not needed are erased from the D: drive by the batch program. The SWOPSIM user then is left with new or modified spreadsheets on the D: drive which must be manually copied to the model subdirectory if they are to be permanently saved. Different operations are carried out by invoking the different programs (programs are marked by single line boxes in the flowchart, while spreadsheets at various stage of construction are marked by double line boxes).

The programming strategy behind the SWOPSIM framework is to make the spreadsheet the temporary and permanent repository for model inputs and

---

[18] The SWOPSIM tutorials SWOPTUT and SWOPARM on the installation disk carry the user through the process of designing and building small net trade and Armington type bilateral trade flow models. The models built, SMAL and LARM, are of minimum size to show SWOPSIM features on a screen. They consist of six products and two regions. In contrast, the model DEMO which is used to illustrate this part of the report is a 22-product, 3-region world model that can be used for realistic practice scenarios. It also carries all of the standard SWOPSIM output routines which are available for models of this size.

SWOPSIM Model Building Flowchart



outputs. Tedious or repetitive spreadsheet operations are automated with DOS batch and/or compiled BASIC programs which write spreadsheet macro (programming) commands which are subsequently executed. All computer program operations are directed by simple DOS batch programs. Since the output of any operation is put on the D: (temporary) drive, mistakes or problems will not wipe out existing spreadsheets. After a manual check of the results, the user can write the new spreadsheets over the old ones on the model file.

SWOPSIM routines have self-prompting instructions. Typing the name of the routine without the accompanying parameters required will give an explanatory screen plus an error message asking for the first parameter. Screen 1 shows what a user will see if CREATEWK (the name of a SWOPSIM program) is typed without the required model name. The screen shows the program name along with a brief description, the requirements for the program to run successfully, the expected output, and the command term and prompts required to run the program.

Screen 1--Self documenting example

```
                    SWOPSIM Program
-------------------------------------------------------------------------
CREATEWK        Program to create a master support spreadsheet for model
                NAME which contains formulas to calculate price wedges for
                SWOPSIM models from data on Producer and Consumer Subsidy
                Equivalents (PSEs and CSEs). This master spreadsheet is
                used each time the program WORK is run to update a support
                spreadsheet for a country.
REQUIREMENTS    Model master NAME.PRN file must be on C:\NAME subdirectory.
OUTPUT (D:)     Master support spreadsheet NAMEWORK.CAL and SuperCalc 5
                macro program NAMETHIN.XQT which is used for WORK program.
-------------------------------------------------------------------------
COMMAND         CREATEWK NAME
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: CREATEWK NAME
C:\>
```

For example, the program CREATEWK needs the four-character model NAME to run correctly. The message at the bottom of the screen below the COMMAND line tells the user that the model NAME was not entered. The screen text above the error message gives a brief description of the program CREATEWK, what is needed to run it, and what the output will be. The user can purposely type CREATEWK without the program NAME to invoke the screen briefing. Appendix F, which lists all of the SWOPSIM programs, shows the screens of each that will be seen when the program is invoked (as shown in the above figure).

Making a Model Subdirectory

Before starting any operation with SWOPSIM, one must establish a subdirectory with a four-character model name (e.g. DEMO) on the C: drive. This subdirectory is used to permanently store all files that are specific to a particular version of a SWOPSIM model. SWOPSIM operations, on the other hand, save all files to the D: (temporary) drive. Files to be kept permanently must be manually transferred to the model subdirectory using the DOS COPY command when the operation is complete.

Preparing a Master Model File

A master model file is a spreadsheet that defines the product and country coverage of the model to be built, and includes world price information on all products that are to be included (see Spreadsheet 1--Master Model File-DEMO).

All model building exercises with the SWOPSIM framework begin with the construction of a master model file. A master model file can either be created manually or reworked from an existing file. For example, the DEMO.CAL file can be renamed and modified to suit a particular country and product coverage. An alternative aid is to run a program called MAKEMAS, which prompts the user for country and product codes. A "bare-bones" master model file will be created on D: along with some other batch and spreadsheet files that are used for customized output programs.

A two-letter nomenclature is required to identify all countries and products (coverage). The country codes are input across columns in row 3 (US, EC, RW) while the product codes are placed in column A beginning from row 5 (BF for beef, PK for pork, ML for mutton & lamb, etc.). The heart of the model specification is the block of codes in cells B5:G26 which define product and country coverage in DEMO. Each cell contains a code which tells SWOPSIM programs that this product (row) exists in a particular form for this country (column). Columns MUST be 3 characters wide in the master model file from column A through the end of the product codes (column G in DEMO.CAL).

Spreadsheet 1--Master model file-DEMO

	A	B	C	D	E	F	G	S	T	U	V	W	X	Y	Z	AQ	AR
1	DEMO	Master model file for DEMOnstration model														1989	World
2																	price
3		US	EC	RW	-	-	-										WDPRICE
4																	
5	BF	D	D	D	IU	.	.									BF	2567
6	PK	D	D	D	IU	.	.									PK	2176
7	ML	D	D	D	IU	.	.	CODE	DEMO COUNTRY/REGION							ML	2321
8	PM	D	D	D	IU	.	.									PM	1039
9	PE	D	D	D	IU	.	.	US	United States							PE	1696
10	DM	D	D	D	IB	IN	NT	EC	European Community (12)							DM	272
11	DB	D	D	D	IU	OU	.	RW	Rest of World							DB	2866
12	DC	D	D	D	IU	OU	.									DC	3009
13	DP	D	D	D	IU	OU	.	CODE	PRODUCT GROUP------							DP	2326
14	WH	1	1	1	I	.	.									WH	169
15	CN	1	1	1	I	.	.	BF	BeeF and veal							CN	111
16	CG	1	1	1	I	.	.	PK	PorK							CG	105
17	RI	1	1	1	.	.	.	ML	Mutton and Lamb							RI	320
18	SB	1	1	1	I	IN	.	PM	Poultry - Meat							SB	275
19	SM	D	D	D	IB	OU	.	PE	Poultry - Eggs							SM	247
20	SO	D	D	D	IU	OU	.	DM	Dairy - fresh Milk							SO	431
21	OS	1	1	1	I	IN	.	DB	Dairy - Butter							OS	630
22	OM	D	D	D	IB	OU	.	DC	Dairy - Cheese							OM	200
23	OO	D	D	D	IU	OU	.	DP	Dairy - milk Powder							OO	774
24	CT	1	1	1	.	.	.	WH	WHeat							CT	1674
25	SU	1	1	1	.	.	.	CN	CorN							SU	282
26	TB	1	1	1	.	.	.									TB	3844
27	^																
28																	
29	CODE DEFINITION OF MATRIX CELL CODES																
30																	
31	.	No equation created for this country/region & product															
32		(however, note that RW region MUST have equations for all															
33		products to close world model).															
34																	
35	1	Supply and demand equations created for this country/region															
36		& product.															
37																	
38	D	Supply and demand equations created AND supply quantity for this															
39		country/region & product can be included in any DEMAND equation.															

	SECTOR CODES		
	IU	Input Using sector	
	I	Input (e.g. feed)	
	IB	Both Input and Input using	
	IN	intermediate demand INput	
	OU	intermediate demand OUtput	
	NT	Non-Traded product	
	CODE	PRODUCT GROUP------	
	CG	other Coarse Grains	
	RI	RIce	
	SB	SoyBeans	
	SM	SoyMeal	
	SO	SoyOil	
	OS	Other oilSeeds	
	OM	Other Meals	
	OO	Other Oils	
	CT	CoTton	
	SU	SUgar	
	TB	ToBacco	

Matrix cell codes (D,1, or .) partly define the economic structure (supply and demand equations) for that product in the particular country. Sector codes ((IU,I,IB),(IN,OU),(NT)), placed in consecutive columns after cell codes,

identify whether the product sector is an input, an intermediate input or output, or a nontraded product (see 21 for a discussion of these joint products.) These codes cause columns to be reserved during the model creation process for intermediate demand coefficients (such as, the inclusion of meat supply variables in feed demand equations). In some cases, they cause demand prices to be used when an input price appears in a supply equation (such as, feed demand prices in meat supply equations). Some codes are used for joint product specification (such as OU when soybeans are crushed to produce meal and oil). Nomenclatures for the product and country codes in the model DEMO are defined in other parts of the spreadsheet. World reference prices MUST always be entered in column AR; the master model file is the primary source for world reference prices.

The RW (rest-of-world in column D above) region must have equations for all products because it closes the system (the last region column MUST be RW in all SWOPSIM models). Hence, in a three-region world, such as modeled in DEMO, RW must be the third and final region. After the master model file is set up, it is saved on the model subdirectory as a .CAL file. Part of the DEMO.CAL file (the range A1:H27) must be output as an ASCII (.PRN) file to the C:\DEMO subdirectory. This .PRN file (DEMO.PRN in the example) will be the basis of almost every SWOPSIM operation. Note that the .PRN file should be checked/edited so that the first letter of the commodity code (the B in BF in DEMO.PRN) is in the 7th row and 7th column. The program MAKEPRN will create this file after the proper range has been specified and saved with the master model file. The range should encompass all the product, country, and sector codes, plus one more column and row as delimiters to provide SWOPSIM programs with equation writing instructions.

Constructing Country Base Quantity Data Spreadsheets

A country base domestic and trade quantity data spreadsheet (a t file) contains country imports, exports, net trade (exports minus imports), production, and total demand (including stock changes) for each product in the model. This spreadsheet must exist for each country/region in the model, and it must be created manually, since there is no SWOPSIM template writing program for this spreadsheet.

Spreadsheet 2 shows imports, exports, net trade, production, and consumption quantity data in columns B through F starting in row 3 for the US for the model DEMO. Common units must be used for all products (ERS SWOPSIM models use 1000 metric tons). Other columns and rows can contain codes and headings as illustrated above. Base quantity data files must be saved for each country in a model on the model subdirectory. These files are the primary storage for the base data. If you change base data, it has to be done in these base quantity data spreadsheets (t files).

For a world model to be balanced before policies are changed, the net trade (column D) must be made to sum to zero across all countries, and total world production must equal total world demand. Adjustments to achieve this balance must be made by the user in the RW base data file (or other country files). Most global trade data sets do not automatically balance, that is, exports do not equal imports on a global basis. There are many reasons for this, including data error and differences in crop years across countries. However, the researcher will have to balance data globally when initializing a world model, and this is typically done by adjusting the residual (RW) country data.

Spreadsheet 2--Base quantity data spreadsheet

	A	B	C	D	E	F	G	H	I	J
1	DEMOtUS	Total	Total	Net	Domestic	Domestic	TSDATA			
2	1989	Imports	Exports	Trade	Supply	Demand	PRow#->	3		
3	BF	987	482	-505	10655	11160			BeeF & veal	
4	PK	407	122	-285	7176	7461			PorK	
5	ML	27	2	-25	157	182			Mutton, Lamb & goat	
6	PM	0	426	426	9984	9558			Poultry Meat	
7	PE	10	83	73	4104	4031			Poultry Eggs	
8	DM	0	0	0	65432	65432			Dairy Milk	
9	DB	2	68	66	572	506			Dairy - Butter	
10	DC	125	7	-118	2531	2649			Dairy - Cheese	
11	DP	1	145	144	395	251			Dairy - Powder	
12	WH	637	33557	32920	55406	22486			WHeat	
13	CN	51	59693	59642	191198	131556			CorN	
14	CG	1360	9208	7848	30245	22397			other Coarse Grains	
15	RI	162	2497	2335	5010	2675			Rice	
16	SB	100	16874	16774	52439	35665			SoyBeans	
17	SM	5	4404	4399	24518	20119			SoyMeal	
18	SO	23	680	657	5743	5086			SoyOil	
19	OS	349	607	258	6900	6642			Other oilSeeds	
20	OM	376	131	-245	2242	2487			Other Meals	
21	OO	979	435	-544	1068	1612			Other Oils	
22	CT	0	1698	1698	2655	957			CoTton	
23	SU	1753	463	-1290	6089	7379			SUgar	
24	TB	180	225	45	559	514			ToBacco	

Creating Policy Support Spreadsheets

A policy support spreadsheet (an **s** file) houses policy data (from PSE and CSE calculations) which are used to generate producer and consumer incentive prices, support wedges, base government expenditures, quota rents, and other measures of economic welfare. A policy support spreadsheet should exist for all countries in the model.

A generic policy support spreadsheet (NAMEWORK.CAL) containing formulas for a model is created by running CREATEWK (see screen 1). To create a support spreadsheet for a specific region, the generic spreadsheet must be saved under the region name. For example, the US support spreadsheet would be DEMOsUS.CAL. The file(s) created will have no data, only commodity nomenclatures and column headings.

Appendix B contains documentation of DEMO and information in the country spreadsheet DEMOsUS. Spreadsheet 3 shows part of DEMOsUS, the policy support spreadsheet that is used for entering support data. Data from PSE and CSE calculations for production (in 1000 metric tons) and market price (local currency) go into columns AE and AH, respectively (rows 39 through 60 in DEMOsUS). The quantity data in these columns may be somewhat different from that in column E of the base data spreadsheet (spreadsheet 2), depending upon the source of the data for calculating the policy wedges.

The program WORK collects basic quantity data from the **t** file and inserts it into the support spreadsheeet (**s** file), once the **s** file has been created. Information on the producer share of consumer cost must be entered into column F of the top half of the support spreadsheet. Given a market price, this establishes a fixed margin between the producer and consumer incentive prices calculated in the spreadsheet.

Input data on support (categorized as market support, direct producer support, other producer support, and direct consumer support) go in columns CU:CX (rows

39 through 60 in DEMOsUS). This categorization follows the USDA (88) convention of reporting producer and consumer (PSE, CSE) support (price intervention or market support, direct income support, other producer support, and direct consumer support). All numbers are in local currency; the local currency to U.S. dollar exchange rate must be put into cell K1 (see DEMOsUS, which is documented in Appendix B).

Spreadsheet 3--Portions of policy support spreadsheet

	AB	AC	AE	AF	AG	AH	CU	CV	CW	CX
3	1=Quota,	12/13/90								
4	2=Exp.T.									
5	3=Imp.T.	US								
6										
7	3	BF								
8		PK								
9	3	ML								
10	2	PM								
11	2	PE								
12	1	DM								
13	2	DB								
14	1	DC								
15	2	DP								
16	2	WH								
17		CN								
18		CG								
19		RI								
20		SB								
21		SM								
22		SO								
23		OS								
24		OM								
25		OO								
26		CT								
27	1	SU								
28		TB								

Data on support from PSE, CSE calculations are entered into the parts of the spreadsheet DEMOsUS shown here. Parts of the spreadsheet are shown in Appendix B.

Enter quantity and market price data, support payments as market or direct support, and a marker for market support as a trade tax or quota regime.

When the program WORK is run, the support spreadsheet will be updated with new prices and price wedge calculations. The program SUPPORT takes the price and price wedge data from the support spreadsheet and inserts it into the country spreadsheet.

Data entry parts of DEMOsUS, the US policy support spreadsheet for the demonstration model DEMO (ADEMAND below is calculated by formula in the standard 22 product model, however formulas can be elimated manually if the user wishes).

					A-Market Support	A-Direct Producer Support	A-Other Producer Support	A-Direct Consumer Support
36					----------Local Currency----------			
37	US	ASUPPLY	ADEMAND	AMKPRICE	US			
38								
39	BF	10660	11165	2504	470	203	1804	153
40	PK	7174	7459	1290			655	27
41	ML	152	176	2394	2		33	
42	PM	10029	9601	1113	101	81	715	81
43	PE	4086	4013	1150	40		238	31
44	DM	65432	65432	301	5544		1570	443.21
45	DB	572	506	2820	454			75.44
46	DC	2531	2649	3060	2180			377.2
47	DP	395	251	2326	259			47.15
48	WH	55406	22486	140	280	1027	626	52
49	CN	191198	131556	89		4885	2508	7
50	CG	15694	11622	82		412	117	
51	RI	4910	2622	223		520	101	22
52	SB	52439	35665	203		80	758	4
53	SM			170				
54	SO			452				
55	OS			119				
56	OM			185				
57	OO			441				
58	CT	2655	957	1270		1000		
59	SU	5613	6802	356	594	3	125	
60	TB			3583				

Next, the user must identify whether the market price support component of domestic support in column AB is derived through 1 (quota, marketing board, or other control), 2 (export taxes/subsides), or 3 (import tariffs). Market price support refers to the price wedge created by border measures. Hence, if an import quota or a marketing board creates the price gap, a 1 is put in the

appropriate cell in column AB. Export taxes or import tariffs have a revenue component associated with them and should be marked by a 2 or 3. This procedure allows one to calculate the budget impact of market support policies.

The policy support spreadsheet values for each country in a model should be saved on the model subdirectory. Then, the program WORK is run to create the support wedges, the producer and consumer incentive prices, budgetary information, and other indicators. WORK will also load base data from the country base data spreadsheet. After WORK has run, the completed support spreadsheet should be saved on the model subdirectory.

The policy support spreadsheet also has indicators and checks on policy data that help gauge its "reasonableness." For example, PSEs are recalculated with model base and support data and can be compared with those published with the source support data. Any change of support data or base quantity data requires re-running WORK to re-create a new set of price wedges and supporting data. Once the program WORK (screen 2) is invoked with the proper prompts, the program runs until completed. WORK takes formulas from the NAMEWORK generic file and uses them to update prices, price wedges, and other data. Resulting values are saved on the D: drive in NAMEsCD (DEMOsUS is the example for the model DEMO in Appendix B and Spreadsheet 3).

Screen 2--Update support spreadsheet-WORK

```
                    SWOPSIM Program
-------------------------------------------------------------------------
WORK            Program to recalculate a country support spreadsheet
                for country CD in the model NAME.  WORK must be used if
                support/market price or base data is changed.
REQUIREMENTS    Master support spreadsheet file NAMEWORK.CAL, country
                support spreadsheet file NAMEsCD.CAL, and country base
                data file NAMEtCD.CAL on the C:\NAME subdirectory.
OUTPUT (D:)     Two country/region support spreadsheets.  NAMEsCD.CAL
                contains the recalculated support information without
                formulas.  This file should be saved to the C:\NAME
                subdirectory.  NAMEsCDF.CAL contains the updated support
                information with calculating formulas for reference.  It
                need not be saved.  (If WORK is run in a multi-country
                loop only the last formula support sheet in the loop
                will remain).
-------------------------------------------------------------------------
COMMAND         WORK NAME CD
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: WORK NAME CD
C:\>
```

Creating Country Model Spreadsheets

A country spreadsheet (a **b** file) contains all of the country model data on supply, demand, and trade. It also includes supply and demand elasticities and other model parameters, along with producer and consumer incentive prices and price wedge information created in the policy support spreadsheet. All of this information, when correctly entered, is used by a SWOPSIM program (EQUATION) to create supply and demand equations as well as economic indicators (which are also kept in this spreadsheet). A country spreadsheet is required for each country/region defined in the master model file. It is analytically equivalent to a multi-commodity country model assuming world prices fixed.

The country spreadsheet for each region (see the example for DEMO in Appendix B--Country Model Spreadsheet--DEMObUS) specified in the master model file is originally built by running the program CREATE (see Screen 3). It contains cells to input supply and demand elasticities and information on base quantities and prices. The created spreadsheets have no data (except world

prices in column B from the master model file), just formulas in selected cells.

The actual prompt when CREATE is run is shown in screen 3. The program prompts for a yes (Y) or no (N) for "symmetry" formulas to be written in the elasticity matrices. Note that other programs that do not have any internal prompts will run uninterrupted, sometimes giving a progress message on the screen.

Screen 3--Program CREATE

```
                    SWOPSIM Program
-------------------------------------------------------------------------
CREATE          Program to create all the template SWOPSIM country/region
                files for the model NAME from a master file.  Each file,
                NAMEbCD.CAL (CD = country CoDe) must be saved to the
                C:\NAME subdirectory. Then elasticities, model parameters,
                base data, and support price wedges must be correctly
                entered into each file before the equations are written
                with the program EQUATION.  The program also creates a
                batch file, NAMELOOP.BAT which must be saved in the
                C:\BATCH subdirectory.  This file allows automatic
                execution of SWOPSIM programs for all countries in NAME.
REQUIREMENTS    A C:\NAME subdirectory must contain the master model
                file NAME.CAL and its ASCII version, NAME.PRN.  The C:
                directory should contain INOUT.TXT and SC5.TXT files,
                the SuperCalc 5 spreadsheet (on a C: subdirectory) with a
                SC.BAT calling file, BASRUN programs, and SWOPSIM
                correctly installed.
OUTPUT (D:)     NAMEbCD.CAL file for each country/region (with CoDe CD)
                in the model NAME and a NAMELOOP.BAT file.
-------------------------------------------------------------------------
COMMAND         CREATE NAME
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: CREATE NAME
C:\>
```

SWOPSIM provides two options regarding the elasticities: one can either input all elasticities as thought appropriate, or one can use relationships from dual production or demand theory. If the first approach is followed, answer no (N) to the symmetry questions in CREATE, and input elasticities as desired. Alternatively, the symmetry option for supply elasticities can be selected and/or other patterns such as homogeneity can be put on the elasticities that are entered manually.

Screen 4 shows the screen prompts seen when the program CREATE is run with the model named DEMO. Note that the program has read the DEMO.PRN file for country and product codes and asks for a yes (Y) or (N) for symmetry formulas in (elasticity) matrices. Most SWOPSIM programs will show country/region and products codes at the beginning of their operation.

If, on the other hand, one wishes to minimize the search for elasticities and impose relationships based on microeconomic theory, and one is building a model based on the ERS 22-product SWOPSIM database, then the optional program BLANK can be run after the country model spreadsheets have been created and saved on the model subdirectory. BLANK (screen 5) will impose three types of specifications from columns E and F of the master model file: (1) joint product specification for the dairy and oilseeds sectors, (2) intermediate demand relationship between output supply (livestock products) and input use (e.g. corn), and (3) input demand specification (e.g. corn) based on intermediate and final demand relationships.

BLANK mechanically uses prepared spreadsheet cell designation template files to blank out unwanted cells and a file of spreadsheet macros to enter formulas imposing a structure on elasticities (21,76). It is important to understand

that although SWOPSIM models have simple constant elasticity specification, a potential user may impose any desired properties on those elasticities.

If symmetry is selected (screen 4), the country spreadsheet protects those cells that are automatically calculated by symmetry formulas and unprotects the cells that need to have elasticities inserted exogenously.

There are three other sets of parameters relating to the demand and supply elasticity matrices that are input into the example DEMO country spreadsheet to complete the specification: the share of each feed (WH, CN, etc.) used in the production of the various livestock products (SBF, SPK, etc., blocks X33:AJ45, Appendix B), the own price elasticity of final demand for products used as inputs (e.g. elasticity of demand for wheat used for nonfeed purposes, FLDELAS-block AO33:AO45, Appendix B), and the proportion of these products not used as inputs to other products in the model (FLDSHARE-block AN33:AN45, Appendix B).

Screen 4--Program prompt for CREATE

```
Program to create new blank country/region spreadsheets from master
file (spreadsheet).  The new spreadsheets will be empty -
elasticities and base data must be added to the new spreadsheets in
order to create constants and equations with the 'EQUATION'
program.  Master '.CAL' AND '.PRN' files must be on a subdirectory.

Be sure to answer all questions with CAPITAL LETTERS!


Reading master file - C:\DEMO.PRN


Countries/regions are:

US EC RW

Product groups are:

BF PK ML PM PE DM DB DC DP WH CN CG RI SB SM SO OS OM OO CT SU TB

Do you want symmetry formulas in matrices (Y or N)?
```

Screen 5--Program BLANK

```
                    SWOPSIM Program
-------------------------------------------------------------------------
BLANK          Optional program to BLANK out unneeded parts of country
               elasticity matrices and make any other adjustments
               for the model country file NAMEbCD.
REQUIREMENTS   Country model file NAMEbCD.CAL on the D: drive.
               The ASCII file NAMEBLNK.TXT (containing cell blocks to be
               blanked) and the ASCII SuperCalc 5 macro file NAMEXQT.XQT
               (containing macros to make adjustments, write formulas,
               etc.) must be on the C:\NAME subdirectory.  (Caution,
               if some country models do not have equations for some
               sectors, NAMEXQT.XQT's actions may have to be manually
               erased for these sectors after BLANK is run).
OUTPUT (D:)    Blanked/adjusted country model file.
-------------------------------------------------------------------------
COMMAND        BLANK NAME CD
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: BLANK NAME CD
C:\>
```

Once this stage has been reached, the country spreadsheet is saved on the model subdirectory as a .CAL file (DEMObUS.CAL for the demonstration example). Then, the program SUPPORT (screen 6) is run which takes the price, policy, and budget information from the country support spreadsheet as well as the base data from the country base data spreadsheet and copies it into the country model spreadsheet. The country model spreadsheet is saved again on the model

Screen 6--Program SUPPORT

```
                    SWOPSIM Program
-------------------------------------------------------------------------
SUPPORT         Program to add prices and price wedges from a support
                spreadsheet and base data from a quantity base data
                spreadsheet to a country model spreadsheet NAMEbCD.CAL.
                (Caution, if NAMEbCD.CAL contains formulas relating
                elasticities, calculated elasticities may change--check
                new elasticities manually before running EQUATION to
                to re-initialize the model).
REQUIREMENTS    Country model spreadsheet NAMEbCD.CAL, support
                spreadsheet NAMEsCD.cal, and base quantity data
                spreadsheet NAMEtCD.CAL must be on C:\NAME model
                subdirectory.
OUTPUT (D:)     Country model spreadsheet with new prices, price wedges,
                and base quantity data.
-------------------------------------------------------------------------
COMMAND         SUPPORT NAME CD
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: SUPPORT NAME CD
C:\>
```

subdirectory (in the example, C:\DEMO\DEMObUS). At this point a final visual check of the reasonableness of all of the parameters, elasticities, and data in the country spreadsheet should be made to prepare for the final country model operation. The country spreadsheet will be ready when the program EQUATION has been run; that is, initialization of the country model to base year data.

Screen 7--Program EQUATION

```
                    SWOPSIM Program
-------------------------------------------------------------------------
EQUATION        Program to initialize constants to base data, write
                equations, and write economic indicator formulas in
                country spreadsheet NAMEbCD.CAL.
REQUIREMENTS    Country spreadsheet NAMEbCD.CAL with base data,
                prices and price wedges, elasticities, and all other
                parameters must be on model subdirectory C:\NAME.
OUTPUT (D:)     New initialized country spreadsheet NAMEbCD.
-------------------------------------------------------------------------
COMMAND         EQUATION NAME CD
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: EQUATION NAME CD
C:\>
```

The prompt for program EQUATION is shown in screen 7. This program takes elasticities and base price and quantity data entered into the country spreadsheet and writes standard constant elasticity equations into the same spreadsheet. It also writes equations for welfare measures and other economic indicators (see Appendix A--Annotated Listing of SWOPSIM Variables and Formulas). A country spreadsheet is akin to a country model with world prices fixed. The newly initialized country file must be saved on the model subdirectory. All of the above procedures for country support and model spreadsheets, including EQUATION, must be repeated for all countries in a model. There are batch looping programs (DEMOLOOP) that can carry out any of the model operations for all countries in a model.

When all of the above operations are completed and all files are saved on the model subdirectory, the user is ready to assemble a global model. This final program takes the essential equations and parameters from each country spreadsheet and combines them, one country to a page, in a multi-page spreadsheet. A global trade linkage page is created with a global market clearing mechanism linking world prices to net trade in all of the country spreadsheets. There is also an alternative of generating a global single commodity model from the country model spreadsheets.

Whenever data or parameters are changes, a sequence of operations shown in figure 2 must be repeated to update model equations in a country model (b) file. If support measures are changed in an **s** file, WORK must be run followed by SUPPORT and EQUATION. If base data are changed in a **t** file, SUPPORT and EQUATION must be run again. If elasticities are changed in a **b** file, EQUATION must be repeated to re-initialize the equations.

Generating a Multi-Commodity World Model, DEMOWD

A SWOPSIM world model is the compilation of the various country models into one large spreadsheet to create a multi-commodity, multi-country world model. Implications of policy changes can be studied across countries and commodities. The world model forms a multi-page spreadsheet with one page to a country and a beginning page of equations to close world product markets.

Screen 8--Program WORLDMOD

```
                    SWOPSIM Program
-------------------------------------------------------------------------
WORLDMOD        Program to create a world multi-product multi-country
                world model from country/region model spreadsheets
                in the model subdirectory, C:\NAME.  The country
                spreadsheets should be fully completed and initialized.
REQUIREMENTS    The C:\NAME subdirectory must contain initialized country/
                region spreadsheets for all countries in the model NAME.
OUTPUT (D:)     A NAMEWD.CAL world model spreadsheet with the first page
                containing the world market clearing mechanism and
                subsequent pages containing country model equations and
                variables that can be used to apply policy and other
                economic shocks to the world model.
-------------------------------------------------------------------------
COMMAND         WORLDMOD  NAME
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: WORLDMOD NAME
C:\>
```

Once country model spreadsheets are fully prepared, a multi-commodity, multi-country world model based on the specifications in the master model file can be created by running the program WORLDMOD (screens 8 and 9). WORLDMOD takes selected product rows from country spreadsheets and assembles a world model in a new multi-page spreadsheet. The world model spreadsheet contains the country equations and the world market equilibrium mechanism but does not contain

Screen 9--Prompt for program WORLDMOD

```
Program to create a world multi-region multi-product model spreadsheet
from country/region spreadsheets.  The spreadsheets must contain base
data, elasticities, and equations before the world model is
created with this program.


Reading master file - DEMO


Countries/regions are:

US EC RW


Product groups are:

BF PK ML PM PE DM DB DC DP WH CN CG RI SB SM SO OS OM OO CT SU TB

Rightmost column is CU


Hold any country/region constant (Y or N {default})?


Hold constant any product groups (Y or N {default})?
```

economic indicators or base data. If global trade balances, the global model is in equilibrium in the base period (reproduces the base data). This world model (DEMOWD.cal) must be saved on the model subdirectory.

Screen 9 shows the prompts for the program WORLDMOD. The prompts allow the user to hold either a country(s) or product(s) (or both) constant while constructing a world model from the country model spreadsheets. This feature replaces equations with values so that the world model will not iterate on the fixed values. This is a powerful option for SWOPSIM which allows the quick genreration of ceterus paribus models, each of which can saved with a different letter code (e.g. DEMOWDA, DEMOWDB, etc.).

Simulating the World Model

The world model is created in a balanced state; that is, it reproduces the base data. If the spreadsheet is recalculated (solved), nothing happens; indeed this is a "test" of the successful assembly of a world model with the program WORLDMOD.

If a policy shock is inserted by entering a supply or demand shift or changing a price wedge, an initial disequilibrium will be created and world trade will be unbalanced. When the spreadsheet is recalculated, it will seek a new equilibrium which rebalances world trade via world price changes which are fed back into country pages of the world model. The spreadsheet "solves" for the new equilibrium automatically with its internal solution algorithm (screen 10).

The spreadsheet environment is advantageous for the solution of simultaneous equations because the solution process can be stopped at any time and troublesome variables can be examined at will. However, spreadsheets are not as fast at solving simultaneous equations as tailored computer algorithms. If model size can be kept down, smaller models solve considerably faster in spreadsheets than larger ones.

Screen 10 shows part of page 1 of DEMOWD (DEMOWD!1), the world market solution mechanism in a balanced state. The world model is created in a 3-dimensional spreadsheet with the world market clearing mechanism on the first page and country equations on subsequent pages. The world trade column (WDTRADE) contains zeros

Screen 10--Part of a balanced DEMOWD

1|	A	AE	AF	AG	AH	AI	AJ	AK
51								
52	DEMOWD	WDTRADE		WEIGHT	LWDPRICE		WDPRICED	WDPRICE%
53	BF	0		.8	2567.00		0	.00
54	PK	0		.8	2176.00		0	.00
55	ML	0		.8	2321.00		0	.00
56	PM	0		.8	1039.00		0	.00
57	PE	0		.8	1696.00		0	.00
58	DM	0		0	272.00		0	.00
59	DB	0		.8	2866.00		0	.00
60	DC	0		.8	3009.00		0	.00
61	DP	0		.8	2326.00		0	.00
62	WH	0		.8	169.00		0	.00
63	CN	0		.8	111.00		0	.00
64	CG	0		.8	105.00		0	.00
65	RI	0		.8	320.00		0	.00
66	SB	0		.8	275.00		0	.00
67	SM	0		.8	247.00		0	.00
68	SO	0		.8	431.00		0	.00
69	OS	0		.8	630.00		0	.00
70	OM	0		.8	200.00		0	.00

DEMOWD!1!AE51
Width: 9 Memory: 3486 Last Col/Row:AK74
1>

and the world price change column, WDPRICE%, registers no change. A view of an interrupted solution from DEMOWD, where world trade is unbalanced and world price changes are occurring, is shown in screen 11. As world markets clear, world trade will clear for each product, world price changes will settle down to constant values, and the iteration process will stop.

Screen 11--Interrupted solution-DEMOWD

```
   1|   A   ||   AE  ||   AF  ||   AG  ||   AH  ||   AI  ||   AJ  ||   AK
|
51
52     DEMOWD  WDTRADE          WEIGHT LWDPRICE          WDPRICED WDPRICE%
53      BF       -1517              .8  2742.13               175     6.82
54      PK        -625              .8  2222.97                47     2.16
55      ML        -381              .8  2887.83               431    18.57
56      PM       -1240              .8  1243.88               170    16.32
57      PE        -327              .8  1724.11                15      .88
58      DM        4012               0   272.00                 0      .00
59      DB        -618              .8  4210.50              1054    36.77
60      DC       -1074              .8  4814.78              1458    48.47
61      DP        -594              .8  3571.11               818    35.17
62      WH        2028              .8   167.63                -1     -.51
63      CN      -12464              .8   115.66                 2     1.99
64      CG       -8486              .8   109.58                 2     2.31
65      RI        -256              .8   320.46                 0      .08
66      SB        1935              .8   258.89               -12    -4.46
67      SM         335              .8   232.38               -14    -5.55
68      SO           1              .8   431.20                 0      .05
69      OS         790              .8   615.32               -11    -1.74
70      OM        1177              .8   184.86               -11    -5.71
  DEMOWD!1!AE51

Width:  9  Memory: 3476  Last Col/Row:AK74
  1>
```

A SWOPSIM option is available to simplify the configuration of the world model for a liberalization or projection scenario if the model is built from the ERS 22-product SWOPSIM data set. The program FORMULA (screen 12) can insert formulas which simplify liberalization and/or projection scenarios.

Screen 12--Program FORMULA

```
                SWOPSIM Program
-------------------------------------------------------------------------
FORMULA         Program to add liberalization and/or projection formulas
                to an existing world model spreadsheet NAMEWD.
                The liberalization formulas option allows the full or
                partial liberalization of all products in the world model.
                The projection formula options inserts shifters for
                supply equations based on growth rates and for demand
                equations based on growth rates of per capita income and
                population.  This is an optional program.
REQUIREMENTS    A world model spreadsheet on the C:\NAME subdirectory.
OUTPUT (D:)     NAMEWD.CAL world model with formulas.
-------------------------------------------------------------------------
COMMAND         FORMULA  NAME
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: FORMULA NAME
C:\>
```

FORMULA inserts "liberalization" formulas in columns N, O, P, and Q of the world model pages for countries where support is to be eliminated. To liberalize fully, a 1 is put into cells AJ1, AK1, AL1, AM1 for those countries (pages) to be liberalized. A number smaller than 1 is used for partial liberalization; for example, .50 for a 50-percent liberalization. However, one should use extreme caution before running partial liberalizations. The PSE's and CSE's were not meant to be used as price wedges; they are income compensation measures whose use in a model must be carefully considered.

The FORMULA program also has an option for projection formulas if the world model is to be used for projections. If this option is selected, growth rates of supply, per capita income, and population (entered in the country spreadsheets) serve to shift supply and demand schedules into projected positions.

Once a solution is reached, it must be saved as NAMEWM??.cal (e.g. DEMOWM1.cal) on the model subdirectory. Saving the solution as values saves disk storage space and only the values of these key model variables are needed for subsequent calculations of indicator values. A one or two digit identifier or number can be used to uniquely name each solution. Before saving the solution, the selected name should be typed in column AE above the WDTRADE column head. Comments defining this particular solution can be typed to the right of the solution name (NAMEWM?) in the solution spreadsheet.

Since the world model contains only the essential equations for countries and products, additional external work must be done to calculate indicators and measures of change of the solution versus the base period data. Recall that the indicators are kept in the country spreadsheets. It is possible to manually combine these indicators with world model solution values; however, output programs can greatly simplify this process. Output programs, in contrast to SWOPSIM model building programs, are not generic; that is, they are tailored to writing reports of results for models of specific sizes.

There is also the option of creating single commodity world models with the program COMODMOD. The interested reader can refer to the self-documenting instructions for information on this program.

Producing Standard 22-Product Model Output

Since SWOPSIM data and models are contained in spreadsheets, the contents are available via common spreadsheet output commands. However, output routines for SWOPSIM spreadsheets make it much easier to print summary elasticity data, base data, and comprehensive listings of solution output, including all of the indicator variables. Since the reports written by output routines depend upon model size, the software must be modified if the commodity coverage differs from the 22 categories in the DEMO or other ERS models. These programs are EOUT, BOUT, and SOUT. See the section below on nonstandard (non-22-product) model output for alternative output programs.

The program EOUT (screen 13) prints a 1-page summary of country supply, demand, and feed share elasticities (Appendix B). Examples of printed output from the DEMO model are found in Appendix B--Documentation of DEMO.

Screen 13--Output program-EOUT

```
                    SWOPSIM Output Program
-------------------------------------------------------------------------
EOUT            Program to put a page of country Elasticities OUT to a
                printer or a disk file.  Elasticities for supply, demand,
                and feed demand are included.
REQUIREMENTS    Country model file (NAMEbCD.CAL) containing elasticities
                on the model subdirectory.  The batch file PRINTSOL must
                be available and configured on the batch subdirectory if
                print option is used.  The template file NAMESUPD.CAL must
                be on the NAME model subdirectory to format the output.
OUTPUT (D:)     One page file of elasticities from a model (NAME)
                country (CD) spreadsheet on to the printer (P) or to a
                disk file (F).
-------------------------------------------------------------------------
COMMAND         EOUT  NAME CD P (or F)
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: EOUT NAME CD P(or F)
C:\>
```

The BOUT program (screen 14) prints a 1-page summary of price, quantity, and support data for each country/region (Appendix C). BOUT collects data from country base data, model, and support spreadsheets. BOUT and other output programs rely on output spreadsheet templates which use cross spreadsheet reference capability to access the contents of several spreadsheets from the template. Once designed for a particular model, the templates are accessed by batch file programming.

Screen 14--Output program-BOUT

```
                SWOPSIM Output Program
-------------------------------------------------------------------------
BOUT            Program to put a page of country Base data OUT for the
                model NAME to a printer or to a disk file.  Base data
                includes quantities, prices, and support information from
                the country model, base data, and support spreadsheets.
REQUIREMENTS    Country model spreadsheet (NAMEbCD.CAL) and country support
                spreadsheet file (NAMEsCD) on model NAME subdirectory.
                The batch file PRINTSOL must be available and configured
                on the batch subdirectory if the print option is used.
                The template file NAMEBASE.CAL must be on the NAME model
                subdirectory to collect and format the base data output.
OUTPUT (D:)     One page printout of model (NAME) base data for
                country (CD) on the printer (P) or to a disk file (F).
-------------------------------------------------------------------------
COMMAND         BOUT  NAME CD P(or F)
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: BOUT NAME CD P(or F)
C:\>
```

There are two ways to view a SWOPSIM solution. The most obvious means would be to look at the solution output on the screen. This may be appropriate in cases where the intent is to look at a few selected model variables. But, in the majority of cases, the information contained on the screen may be inadequate either because it is cumbersome paging through the screens or because the world model on the screen does not contain economic indicator information resulting from policy changes.

Screen 15--Output program-SOUT

```
                SWOPSIM Output Program
-------------------------------------------------------------------------
SOUT            Program to put a file of country Solution values OUT
                to the printer or a disk.
REQUIREMENTS    Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
                Template files NAMESOUT.CAL for the solution output and
                NAMEANAL.cal for the analysis output on the model
                subdirectory.  Three files are also called which can be
                customized.  PRINTSOL.BAT configures the printer,
                NAMESOUT.BAT converts a country code to a model page
                number, and NAMEROWC.BAT gives the row and columns of
                the model solution file.
INPUT           Model NAME, country/region CoDe, solution code X (1 or
                2 digits), and P or F for printer or disk file.
OUTPUT (D:)     Printout or disk file NAMECDM.PRN.  If disk file is chosen,
                a file (NAMECDM.CAL) is also created.  This file can be
                saved for access by other output programs such as TABLE.
                Analysis of the solution is produced on the D: drive as
                NAMECDAX.CAL (and NAMECDAX.PRN if the F option is chosen).
-------------------------------------------------------------------------
COMMAND         SOUT  NAME CD X P(or F)
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: SOUT NAME CD X P(or F)
C:\>
```

Under these circumstances, it is helpful to use the SOUT program (screen 15). SOUT is a batch program that prepares a three-page file of the solution for a selected country inclusive of all the economic welfare indicators specified in the country spreadsheets. The third page, the output from an analysis program, is a matrix which breaks down the supply and demand effects into their components so the user can gauge the relative importance of factors producing changes. The file produced by SOUT may be printed or written out to

disk. If the file is to be printed, the printer must be set to accommodate 209 character wide printouts in the landscape mode. All of the output programs can be run with looping programs which sequentially execute the program for all countries in a model (e.g. DEMOLOOP SOUT X P).

In addition to SOUT, there are a number of other output programs such as TABLE and COMPARE (see spreadsheet 4 for an example of output from COMPARE which gives solution results for wheat for the US, EC, and rest of the world in metric and US price and quantity units) that facilitate analysis. Their functions can be examined using the self-documenting feature available with all SWOPSIM programs; typing the name of any SWOPSIM program results in onscreen documentation. The simplicity of output programming, with DOS batch programs and spreadsheet templates, allows the user to customize output.

Spreadsheet 4--Part of output for US wheat from the program COMPARE

PRODUCTION

	United States	European Community	Rest-of-World
	Quantity 1000 MT		
Base	55,406	78,576	402,986
New	58,359	78,402	402,594
Diff.	2,953	-174	-392
	MIL. BU		
Base	2,036	2,887	14,807
New	2,144	2,881	14,793
Diff.	108	-6	-14
	PERCENT		
% Diff.	5.3%	-.2%	-.1%
Base Shr.	10.3%	14.6%	75.0%
New Shr.	10.8%	14.5%	74.6%
	Market Price $/MT		
Base	$140	$195	$130
New	$137	$161	$131
Diff.	$-3	$-35	$1
	$/BU		
Base	3.81	5.32	3.54
New	3.73	4.37	3.57
Diff.	-.08	-.95	.03
	PERCENT		
% Diff.	-2.2%	-17.8%	.7%
	Market Value Mil. $		
Base	$7,757	$15,350	$52,446
New	$7,989	$12,585	$52,779
Diff.	$232	$-2,764	$333
	PERCENT		
% Diff.	3.0%	-18.0%	.6%
	Producer Incentive Price $/MT		
Base	$159	$186	$134
New	$137	$161	$135
Diff.	$-22	$-26	$1
	PERCENT		
% Diff.	-13.6%	-13.8%	.7%

CONSUMPTION

	United States	European Community	Rest-of-World
	Quantity 1000 MT		
Base	22,486	58,302	456,180
New	22,801	60,620	455,933
Diff.	315	2,318	-247

INCOME, BUDGET, AND WELFARE

	United States	European Community	Rest-of-World
	Changed Produc. Income Mil. $		
Prod. Surp.	$-1,209	$-1,574	$301
	Percent of Base Market Value		
	-15.6%	-10.3%	.6%
	Changed Cons. Expend. Mil. $		
Cons. Surp.	$18	$1,967	$-435
	Percent of Base Cons. Value		
	.4%	12.1%	-.5%
	$ PER CAPITA		
	$.07	$6.06	$-.10
	Changed Govt. Expend. Mil. $		
Govt. Expd.	$-1,249	$-199	$-2
	Changed Natl. Welfare Mil. $		
Welfare	$58	$592	$-197
	Percent of National Income		
	$ Per Capita		
	$.23	$1.82	$-.04

NET TRADE

	United States	European Community	Rest-of-World
	Quantity 1000 MT		
Base	32,920	20,274	-53,194
New	35,558	17,781	-53,339
Diff.	2,638	-2,493	-145
	MIL. BU		
Base	1,210	745	-1,955
New	1,307	653	-1,960
Diff.	97	-92	-5
	Net Trade Value Mil. $		
Base	$5,563	$3,426	$-8,990
New	$6,096	$3,048	$-9,145
Diff.	$533	$-378	$-155
	Self Sufficiency PROD./CONS.		
Base	2.46	1.35	.88
New	2.56	1.29	.88

An example of part of a commodity output file for wheat prepared by the SWOPSIM program COMPARE.

Additional Features Available in the SWOPSIM Modeling Framework

Much of the development of the SWOPSIM framework centered around a standard 22-product model (e.g. DEMO) used for trade liberalization analysis. The 22 products were ones important for U.S. agricultural trade and for which global data sets existed. Many programs, especially those concerned with report writing, typically rely on a template spreadsheet tailored to the 22-product model. This part of the report discusses some of the programs that currently apply only to the standard model as well as a few output routines that are easily adapted to nonstandard models (i.e. a different number of commodities).

Output of Information from Nonstandard SWOPSIM Models

Since SWOPSIM data and models are contained in spreadsheets, the contents are available via common spreadsheet output commands. However, output routines for SWOPSIM spreadsheets make it much easier to print summary elasticity data, base data, and comprehensive listings of solution output, including all of the indicator variables. Since the reports written by output routines depend upon model size, the software must be modified if the commodity coverage differs from the 22 categories in the DEMO or other ERS models. Standard 22-product models use the programs EOUT, BOUT, and SOUT to print out elasticities, base data, and solutions, respectively. For other models, the standard programs have been modified (customized) to become more general programs named CUSEOUT, CUSBOUT, and CUSSOUT, respectively. These programs require that template spreadsheets be created for nonstandard models. The tutorials SWOPTUT and SWOPARM (Appendix C) use this approach to output information from models with only six products.

The program CUSEOUT (Screen 15) calculates and saves (on D:) a summary of elasticity information where the contents and format of the file are created by the user for a model NAME with a template file NAMDSUPD.CAL. The template is created by using SuperCalc 5 formulas in the template file to reach into the country model spreadsheet which is copied to D: by CUSEOUT.

The CUSBOUT program (Screen 16) prints a summary of price, quantity, and support data for a country, according to the template which must be prepared for the model. CUSBOUT collects data from country base data, model, and support spreadsheets copied to D: by CUSBOUT.

As mentioned earlier, there are two ways to view a SWOPSIM solution. The most obvious way is to look at the solution output on the screen or print out the country pages of the world model spreadsheet. The user could call in the indicator formulas from the country model spreadsheets

Screen 15--Output program-CUSEOUT

```
                SWOPSIM Output Program
-------------------------------------------------------------------
CUSEOUT         Program to put CUStomized country Elasticities OUT to a
                disk file for CUStomized printing.  Elasticities for
                supply, demand, and feed demand are included.
REQUIREMENTS    Country model file (NAMEbCD.CAL) containing elasticities
                on the model subdirectory.  The template file NAMESUPD.CAL
                must be on the NAME model subdirectory to format output.
OUTPUT (D:)     Multi-page file of elasticities from a model (NAME)
                country (CD) spreadsheet on a disk file that can be
                printed if the HPLASER program LANDSMAL has been run.
-------------------------------------------------------------------
COMMAND         CUSEOUT  NAME CD
-------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: CUSEOUT NAME CD
C:\>
```

to complete the picture of the solution. This may be appropriate in cases where the intent is to look at a few selected model variables or where a nonstandard model is very small. But, in some cases, the information contained on the screen may be inadequate. If output is to be obtained many times, it is better to customize an output template and use CUSSOUT to output solutions in a systematic way.

Screen 16--Output program--CUSBOUT

```
                SWOPSIM Output Program
-------------------------------------------------------------------------
CUSBOUT         Program to put CUStomized country Base data OUT for the
                model NAME to a disk file for printing.  Base data
                includes quantities, prices, and support information from
                the country model, base data, and support spreadsheets.
REQUIREMENTS    Country model spreadsheet (NAMEbCD.CAL) and country support
                spreadsheet file (NAMEsCD) on model NAME subdirectory.
                A format command must be activated by the HPLASER program
                which sets the laser printer if the disk file is printed.
                The template file NAMEBASE.CAL must be on the NAME model
                subdirectory to collect and format the base data output.
OUTPUT (D:)     Printout of model (NAME) base data for country (CD) on
                a disk file named NAME.PRN.
-------------------------------------------------------------------------
COMMAND         CUSBOUT  NAME CD
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: CUSBOUT NAME CD
C:\>
```

CUSSOUT (screen 17) is a batch program that prepares a file of the solution for a selected country inclusive of all the economic welfare indicators specified in the model solution template.

Screen 17--Output program--CUSSOUT

```
                SWOPSIM Output Program
-------------------------------------------------------------------------
CUSSOUT         Program to put a CUStomized file of country Solution
                values OUT to a disk.
REQUIREMENTS    Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
                Template file NAMESOUT.CAL for the solution output on the
                model subdirectory must be customized for the model NAME.
INPUT           Model NAME, country/region CoDe, and solution code X (1 or
                2 digits).
OUTPUT (D:)     Disk file NAMECDM.PRN and a SuperCalc file NAMECDM.CAL
                which can be saved for access by other output programs
                such as TABLE.
-------------------------------------------------------------------------
COMMAND         CUSSOUT  NAME CD X
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: CUSSOUT NAME CD X
C:\>
```

The template spreadsheet must be prepared for the particular model to be examined. In preparing a template, the main concern is usually the format for printing the results.

In summary, customized output for a nonstandard (other than 22-product) model is quite possible. But time must be spent preparing the customized template spreadsheets. Once they are saved on the model subdirectory, the CUS output programs can be run at will for a nonstandard model.

The wide range of programs and templates available with the 22-product DEMO model make it very attractive to try to operate with the standard model.

The Aggregation of SWOPSIM Models and Data

The original SWOPSIM models relied on global data sets that had information for the world broken down into many countries and regions of the world. For

example, Sullivan, Roningen, and Wainio prepared a global database with 36 countries/regions (82). Given an existing database of SWOPSIM country model, support, and base data spreadsheets on a model subdirectory, it is possible to aggregate data into larger regions for the creation of specialized models. While large models give much detail, a cost of a large model is slow solution time and extraneous information that does not really matter to the problem at hand. Therefore, small models can be created from existing larger ones. This has been done for many studies. The ultimate tradeoff is between the computer burden of large detailed models with possible aggregation error in smaller ones.

Three aggregations programs have been created to aggregate SWOPSIM data sets from the three spreadsheets carrying information for individual countries. The first of these is AGMOD (screen 18) which aggregates elasticities from country model spreadsheets. Supply elasticities are weighted by the value of supply, and demand elasticities by the value of demand. Quantity data in the country spreadsheets are added directly.

Screen 18--Aggregate elasticities in existing SWOPSIM country model spreadsheets-AGMOD

```
                    SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGMOD          Program to aggregate model NAME country spreadsheets.
               Supply and demand elasticities are weighted by supply and
               demand quantities, respectively. Quantities are added.
OUTPUT (D:)    Aggregate spreadsheet named NAMEAMOD on D: drive which can
               be manually swopped with a newly created spreadsheet.
               Bring the new created spreadsheet to the D: drive and copy
               NAMEAMOD to replace it on the model subdirectory. Then use
               the program BLANK to the bring NAMEAMOD elasticities into
               newly created sheet on the D: drive. Remember to re-balance
               world net trade data in the RW region when aggregated
               data is used for an region in a new model. Use TABLE to
               check the net trade data for a world balance. Some
               variables may need to aggregated (perhaps with weights) by
               using the program AGVAR (which allows weighted aggregation
               of selected model variables).
-------------------------------------------------------------------------
COMMAND        AGMOD NAME
-------------------------------------------------------------------------
```

The aggregation program AGDAT (screen 19) adds up the quantity data in the country base data spreadsheets.

For any of the aggregation programs to work, the model spreadsheets to be aggregated must exist on a model subdirectory. The aggregate spreadsheet is created on the D: drive and must be copied elsewhere for safekeeping.

Screen 19--Aggregate data in country base data spreadsheets-AGDAT

```
                    SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGDAT          Program to aggregate base spreadsheet DATa (imports,
               exports, supply, demand) across countries/regions in a
               model file NAME.
OUTPUT (D:)    Aggregate file NAMEADAT. This file must be re-named and
               copied to new model subdirectory.
-------------------------------------------------------------------------
COMMAND        AGDAT NAME
-------------------------------------------------------------------------
```

Screen 20 shows the prompt for the program AGSUP which aggregates support data. This program adds the dollar value of support by category across country. This information becomes the core of support data for a new model.

Screen 21 shows the prompt for a program AGVAR which aggregates a selected variable in a SWOPSIM model. The variable can be weighted in aggregation.

Screen 20--Aggregate support information in country support spreadsheets-AGSUP

```
                SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGSUP           Program to aggregate support expenditure estimates in
                model NAME support spreadsheets.
OUTPUT (D:)     Aggregate support worksheet NAMEASUP.  This spreadsheet
                must be saved to the new model subdirectory where the
                aggregate support is to be used.  Then the WORK program
                must be run to update the new aggregate worksheet.
-------------------------------------------------------------------------
COMMAND         AGSUP NAME
-------------------------------------------------------------------------
```

DEMO is an example of a smaller model created from a larger one. In DEMO, a 33-country/region data set has been aggregated to 3 countries/regions --the US, the EC, and the rest of the world. DEMO is useful for exploring US-EC interactions even though it does not give detail on other countries.

Screen 21--Aggregate a selected variable-AGVAR

```
                SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGVAR           Program to aggregate a selected variable(s) from a
                country model base data spreadsheet, a world model
                solution spreadsheet, or a country support spreadsheet.
                Note that if you want to aggregate variables from a world
                model solution, you must use the LOOP program with SOUT to
                get solution files for each country.
OUTPUT (D:)     Spreadsheet on D: drive named AGVAR
-------------------------------------------------------------------------
COMMAND         AGVAR NAME
-------------------------------------------------------------------------
```

Since SWOPSIM data are kept in spreadsheets, aggregation and other data manipulation can be done by normal spreadsheet data manipulations. These aggregation programs cover certain operations where the manual work involved would be extensive.

The Cloning of New Models from Old Ones

Screen 22--Replicate a set of DEMO model files for a new model-DEMOREPL

```
                DEMO Replication Program
-------------------------------------------------------------------------
DEMOREPL        Program to REPLicate useful DEMO files for a chosen SWOPSIM
                 model, NAME.  DEMO is a 22 product DEMOnstration model.
                 Files are replicated for output templates, batch programs,
                 etc. for a structurally equivalent 22 product model, NAME.
REQUIREMENTS    The DEMO model must exist on the C:\DEMO subdirectory.
OUPUT (D:)      The output files will reside on the D: subdirectory.  Batch
                 files (*.BAT) must be copied manually to the C:\BATCH
                 subdirectory while other files (e.g. *.XQT, *.CAL, etc.)
                 must be copied manually to the C:\NAME model subdirectory.
-------------------------------------------------------------------------
COMMAND         DEMOREPL NAME
-------------------------------------------------------------------------
```

Even for experienced SWOPSIM users, the easiest way to proceed when assembling a new model is to copy or clone it from an old one. The aggregation programs shown above make it particularly easy to create smaller models from larger ones. In addition, if one is operating with a standard 22-product model, the program DEMOREPL will help to create a host of files for a new 22-product

model (screen 21). Finally, since model information is kept in spreadsheets, normal spreadsheet operations can be used to customize or transform an old model into a new one.

The Calculation of Regional Impacts from a Standard Model

Given a country model, it is possible to allocate national impacts to regions using allocation rules. This has been done for the US and the EC-12. National supply information is allocated by the regional share of product value and national demand information is allocated by population of the region. This procedure assumes that regional elasticities equal national ones.

Screen 23--Allocate US national results to a selected US region or state-USREGION

```
                    SWOPSIM Regional Share Program
-------------------------------------------------------------------------
USREGION            Program to print a model (NAME) solution (solution Code C)
                    estimate for a selected US region or state (STATENAME).
REQUIREMENTS        Same as for SOUT.  Also, a file with production/consumption
                    shares by region, USREGION.CAL, must exist on C:\NAME.
.....A listing of full REGIONAME/STATENAME follows.....................
APPALACHIA          KENTUCKY, NORTH-CAROLINA, TENNESSEE, VIRGINIA, WEST-VIRGINIA.
CORN-BELT           ILLINOIS, INDIANA, IOWA, MISSOURI, OHIO.
DELTA-STATES        ARKANSAS, LOUISIANA, MISSISSIPPI.
LAKE-STATES         MICHIGAN, MINNESOTA, WISCONSIN.
MOUNTAIN-STATES     ARIZONA, COLORADO, IDAHO, MONTANA, NEVADA, NEW-MEXICO,
                    UTAH, WYOMING.
NORTHEAST           CONNECTICUT, DELAWARE, MAINE, MARYLAND, MASSACHUSETTS,
                    NEW-HAMPSHIRE, NEW-JERSEY, NEW-YORK, PENNSYLVANIA,
                    RHODE-ISLAND, VERMONT.
NORTHERN-PLAINS     KANSAS, NEBRASKA, NORTH-DAKOTA, SOUTH-DAKOTA.
PACIFIC-STATES      ALASKA, CALIFORNIA, HAWAII, OREGON, WASHINGTON.
SOUTHEAST           ALABAMA, FLORIDA, GEORGIA, SOUTH-CAROLINA.
SOUTHERN-PLAINS     OKLAHOMA, TEXAS.
-------------------------------------------------------------------------
COMMAND             USREGION  NAME  REGIONAME  C
-------------------------------------------------------------------------
```

For the US, this allocation is made with the program USREGION whose prompt is shown in screen 23 (with results for Kansas shown in spreadsheet 5).

A similar type of regional allocation of simulation results is available for the European Community (EC-12). The prompt from the program ECREGION is shown in Screen 24. Here the available breakdown as shown in the screen prompt is the member countries of the EC.

Spreadsheet 5--Portion of the output of USREGION for the State of Kansas

KANSAS						
MPSURPLS	CSURPLUS	BUDGETC	WELFARE	NTRADEVD	NTRADED	SUPPLY%
---------- Million US$ ----------					1000 MT	-------
120	-14	-11	116	223	28	2.3
5	-14	-1	-7	5	5	.9
12	-18	-3	-2	8	3	2.6
-103	-16	-134	15	33	102	.6
-5	1	-1	-3	1	13	.9
-1	1			-4	-15	.1
125	-28	-12	109	227	33	2.2
18	-25	-5	-2	8	3	2.0
-202	-16	-230	12	84	348	1.8
-5	1	-1	-3	-3	-2	.6
	-2		-2	1		7.4
4.0	-7					
131	-36	-13	109	227	33	2.2
-99		-96	-3	51	246	2.7
-206	-15	-231	13	84	360	1.7
-103	-16	-134	15	29	87	.5

Screen 24--Allocation of EC simulation results to member countries-ECREGION

```
                    SWOPSIM Regional Share Program
-------------------------------------------------------------------------------
ECREGION            Program to print a model (NAME) solution (solution code C)
                    estimate for a selected EC region or country (REGIONAME).
                    1988 country production and consumption shares are used to
                    apportion EC (12) data.  EC results are pro-rated for the
                    selected region and printed out in the solution format.
REQUIREMENTS        Same as for SOUT.  Also, a file with production
                    /consumption shares by region, ECREGION.CAL, must exist on
                    C:\NAME subdirectory.
OUTPUT (D:)         A printout and REGIONAME.CAL file of EC results pro-rated
                    for the selected EC country/region.
.............A listing of full REGIONAMEs follows.............................
NORTHERN EUROPE     BELGIUM-LUXEMBOURG, DENMARK, GERMANY, IRELAND,
                    NETHERLANDS, UNITED-KINGDOM.
SOUTHERN EUROPE     FRANCE, GREECE, ITALY, PORTUGAL, SPAIN.
-------------------------------------------------------------------------------
COMMAND             ECREGION  NAME  REGIONAME C
-------------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter: ECREGION NAME REGIONAME C
C:\>
```

As long as value data for regions within a country are available, it is possible to use this technique for countries or regions other than the US or EC. Templates and a region program would have to be created similar to those for the US and EC.

Tables and Other Output

As long as simulation results or model data are available in spreadsheets, the user can readily use the capabilities of SuperCalc 5 to create output spreadsheets that reach into other spreadsheets for data. Model output and report writing is as flexible as the spreadsheet mode of operation.

There is a program TABLE which allows the user to select a variable from a model for compilation in a cross country table (screen 25). The variable can be from a model or support or solution spreadsheet (the latter are created by SOUT and CUSSOUT programs).

Screen 25--Put a variable into a table-TABLE

```
                    SWOPSIM Program
-------------------------------------------------------------------------------
TABLE               Program to create a cross-country table of a variable from
                    a world model solution, a country/region model spreadsheet,
                    or a country/region support spreadsheet.  The program
                    prompts for variable names in the model NAME.
REQUIREMENTS        World model solution and country file for program SOUT,
                    country/region model spreadsheet, or support spreadsheet
                    must be saved on the model subdirectory NAME.
OUTPUT (D:)         Table of selected variable
-------------------------------------------------------------------------------
COMMAND             TABLE NAME
-------------------------------------------------------------------------------
```

Spreadsheet 6 shows a full table created by the program TABLE for a variable from the three-country/region model DEMO. The table program can retrieve data from country model spreadsheets or from the upper or lower portions of country support spreadsheets. In the latter case, the user has to know the cell location of the variable in question. The program TABLE also has prompts that allow the user to select model variables from a list by the column number in which they are located. A user defined template can be added to a table (by responding to a program prompt) to carry out particular operations such as aggregations. The TABLE program is an example of a general output program

which works with models of all sizes.

An example of an output program designed for a particular sized model is the COMPARE program, which produces spreadsheets or a file of commodity information for each product in a model for three countries/regions. The output uses a unit translation table and produces output both in metric and US price and quantity units. This type of output shows how output can be tailored to particular needs by some clever use of spreadsheet templates and DOS batch programs. Screen 26 shows the program prompt for the program COMPARE.

Spreadsheet 6--Output of the program TABLE for a variable from the model DEMO

	A	B	C	D	E	F	G	H
1	TAZCR	PBSE	AZ	Producer Budget Subsidy Equivalent				
2	DEMOTCR	A1:H30						
3	6/14/91	US	EC	RW		SUM	COUNT	AVERAGE
4								
5	BF	19	70	47		136.7531	3	45.58437
6	PK	0	0	22		21.84537	3	7.281788
7	ML	0	1460	18		1477.945	3	492.6480
8	PM	8	0	10		17.62767	3	5.875888
9	PE	0	0	14		13.81885	3	4.606283
10	DM	0	0	16		16.01898	3	5.339660
11	DB	0	0	155		155.1145	3	51.70482
12	DC	0	0	23		23.15366	3	7.717885
13	DP	0	0	0		0	3	0
14	WH	19	-9	4		13.08537	3	4.361788
15	CN	26	-5	1		22.50535	3	7.501781
16	CG	26	-5	11		32.63241	3	10.87747
17	RI	106	0	16		122.0758	3	40.69194
18	SB	2	197	19		217.5254	3	72.50843
19	SM	0	0	0		0	3	0
20	SO	0	0	0		0	3	0
21	OS	0	172	10		182.0404	3	60.68012
22	OM	0	0	0		0	3	0
23	OO	0	0	0		0	3	0
24	CT	377	0	17		393.8135	3	131.2711
25	SU	1	-42	9		-32.4307	3	-10.8102
26	TB	0	50	0		49.88102	3	16.62700
27								
28	SUM	582.0713	1888.340	392.9941	------	2863.405		
29	COUNT	22	22	22	------	22		
30	AVERAGE	26.45779	85.83363	17.86337	------	130.1548		

There are countless possibilities for output routines tailored to particular needs. The more a user knows about spreadsheets, spreadsheet macros, and DOS batch programs, the more options the user has available.

This concludes the main text of the documentation. The user is encouraged to carefully go through the tutorials and any part of the appendices that are of interest. Keep in mind that standard SWOPSIM program options are limited to a set of key operations but more programs will develop with use.

Screen 26--Compare 3 countries' solution values for a product-COMPARE

```
                    SWOPSIM Output Program
-------------------------------------------------------------------------
COMPARE         Program to print out a comparison of solution results for
                3 countries using US Situation-Outlook price/quantity units
REQUIREMENTS    Solution files for each country/region in model created
                by the SOUT progam (stored on the model subdirectory).
                A COMPARE.CAL template file must be on each model
                subdirectory - this file is commodity and country specific.
                A NAMECOMP.BAT and NAMECOM3.BAT customized batch file must
                be on the C:\BATCH subdirectory for each model.  THREE
                countries/regions can be selected for commodity comparison-
                -they MUST have a NAMECOM3.XQT file pre-specified on the
                model subdirectory AND a NAMECOM3.BAT file pre-specified on
                the BATCH subirectory.
OUTPUT (D:)     Printouts of solution (if option P is chosen) or file (if
                F is chosen) information by commodity.  Commodity CAL files
                and aggregates will be on the D: drive (appended with the
                solution Letter).
-------------------------------------------------------------------------
COMMAND         COMPARE NAME L P (or F)
-------------------------------------------------------------------------
ERROR = You forgot model NAME; Enter COMPARE NAME L P(or F)
```

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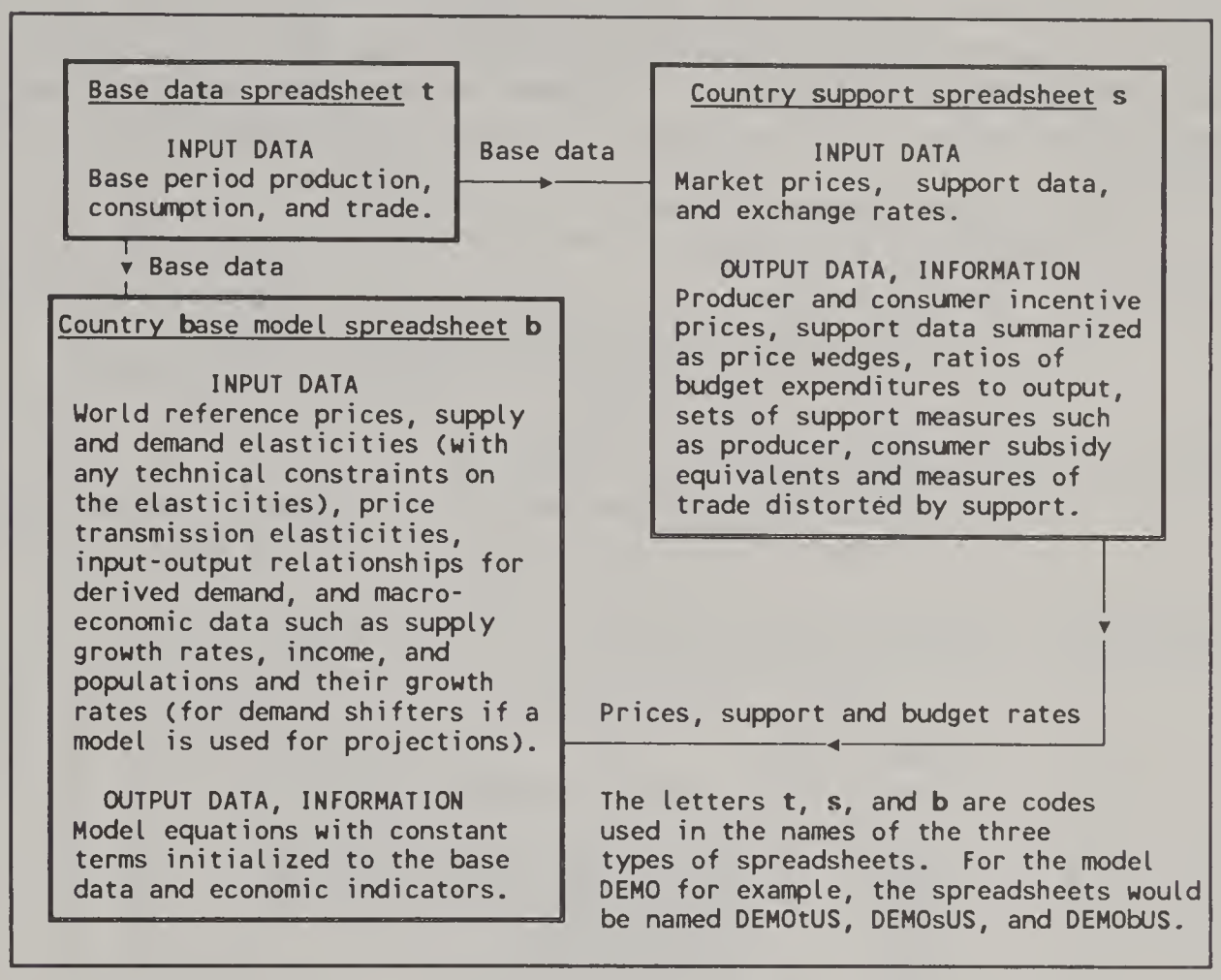
Appendix A--Annotated Listing of SWOPSIM Variables and Formulas

A SWOPSIM model retains information for a country in three spreadsheets. Many types of variables appear in the country model spreadsheet (**b**). A few of the variables representing base quantity (**t** spreadsheet) and price data or support price wedges (**s** spreadsheet) are sourced elsewhere. A few of the variables constitute the core of model equations which are carried into a world model.

Figure A1--Three spreadsheets containing information for a SWOPSIM model



Others make up a set of indicators used to summarize a model simulation result. Some additional variables reside in the country support spreadsheet. These tend to be additional checks on, or measures derived from, the support information used to derive policy price wedges for the model.

Variables in the Country Base Data (t) Spreadsheet

The country base data spreadsheet (t) is the source for base quantity data. The variables names are the same as those used when the data is carried into the country model spreadsheet by the program SUPPORT. The data in this spreadsheet must observe the identities shown in the equations. This is necessary for a balanced country model. In addition, net trade must sum to zero for all countries in a world model for the base period. This insures that world supply equals world demand and that global trade is in balance in a world model in the base period.

Variable Name	Col. Let.	Variable Description and Mnemonic
BGRIMP	B	Base GRoss IMPorts--CARRIED INTO COUNTRY MODEL
BGREXP	C	Base GRoss EXPorts--CARRIED INTO COUNTRY MODEL
NTRADE	D	base Net TRADE == BREXP - BGRIMP == SUPPLY - DEMAND
SUPPLY	E	base SUPPLY quantity (production)--CARRIED INTO COUNTRY MODEL
DEMAND	F	base DEMAND quantity (domestic consumption plus stock changes)--CARRIED INTO COUNTRY MODEL

Variables in the Country Base (b) Model Spreadsheet

Columns B through CU of SWOPSIM country model spreadsheets contain base data variables, formulas calculating indicator variables, equations calculating model variables, constants initialized to base data (by the program EQUATION), and variables representing policy levels. The variable descriptions are those found in the program TABLE which allows the user to generate a table of values for any of these variables. Columns to the left of the variable name give summary information about the variable. The definition of these columns is as follows:

Column I (type of variable)
B = Base data, I = Indicator, V = model Variable,
C = Constant initialized to base data,
P = Policy instrument or economic parameter

Column II (primary spreadsheet source)
t = base data spreadsheet, b = country model base spreadsheet,
s = country support spreadsheet, f = master model file

Column III (country spreadsheet cell contents)
F = Formula, N = Number, ' ' = empty cell in country spreadsheet

I	II	III	Variable Name	Col. Let.	Variable Description and Mnemonic
V	b	N	WDPRICE	B	WorlD PRICE (in current solution)
B	s	N	PRPRICE	C	base PRoducer (incentive) PRICE
B	s	N	CNPRICE	D	base CoNsumer (incentive) PRICE
B	s	N	TDPRICE	E	base TraDe PRICE
B	b	N	XRATE	F	eXchange RATE
B	t	N	SUPPLY	G	base SUPPLY quantity
B	t	N	DEMAND	H	base DEMAND quantity
B	t	F	NTRADE	I	base Net TRADE (SUPPLY - DEMAND)
B	b	N	CTRAN.EL	J	Country price TRANsmission ELasticity variable
B	b	N	WDPT.EL	K	product WorlD Price Trans. ELasticity variable
P	b	N	SSHIFT	L	Supply SHIFT variable (-1 < SSHIFT < 1)
P	b	N	DSHIFT	M	Demand SHIFT variable (-1 < DSHIFT < 1)
P	b	E	PRSUBW	N	PRoducer SUBsidy Wedge variable (price unit)
P	b	E	CNSUBW	O	CoNsumer SUBsidy Wedge variable (price unit)
P	b	E	IMSUBW	P	IMport SUBsidy Wedge variable (price unit)
P	b	E	EXSUBW	Q	EXport SUBsidy Wedge variable (price unit)
V	b	F	SCROSSO	R	Supply equation CROSS price Overflow term
V	b	F	DCROSSO	S	Demand equation CROSS price Overflow term
C	b	N	TDCONST	T	world-TraDe price CONSTant
C	b	N	PRCONST	U	PRoducer-trade price CONSTant
C	b	N	CNCONST	V	CoNsumer-producer price CONSTant
V	b	F	LPRPRICE	W	Liberalized PRoducer (incentive) PRICE
V	b	F	LCNPRICE	X	Liberalized CoNsumer (incentive) PRICE
V	b	F	SCROSS	Y	Supply equation CROSS price term
V	b	F	DCROSS	Z	Demand equation CROSS price term
C	b	N	SCONST	AA	Supply equation CONSTant
C	b	N	DCONST	AB	Demand equation CONSTant
V	b	F	SUPPLYEQ	AC	liberalized SUPPLY EQuation quantity
V	b	F	DEMANDEQ	AD	liberalized DEMAND EQuation quantity
V	b	F	NTRADEEQ	AE	liberalized Net TRADE EQuation quantity (SUPPLYEQ - DEMANDEQ)
V	b	F	TRADEOQ	AF	price adjustment for non-TRADEd (0 trade Quantity) product (price unit)
P	b	N	SUPGROW	AG	SUPply GROWth rate
P	b	N	INCELAS	AH	INCome ELASticity
P	b	N	PTELAS	AI	Product world price Transmission ELASticity (0 =< PTELAS <=1)
P	s	N	DPSW	AJ	Distorting Producer Subsidy price Wedge number (price unit)
P	s	N	CSW	AK	Consumer Subsidy price Wedge number (price unit)
P	s	N	MSW	AL	iMport Subsidy price Wedge number (price unit)
P	s	N	ESW	AM	Export Subsidy price Wedge number (price unit)
V	b	N	NTSSHIFT	AN	Non-Trade policy Supply SHIFT term
I	b	F	SUPPLYD	AO	SUPPLY quantity Difference from base
I	b	F	DEMANDD	AP	DEMAND quantity Difference from base

I	b	F	NTRADED	AQ	Net TRADE quantity Difference from base
I	b	F	PRPRICED	AR	PRoducer PRICE Difference from base
I	b	F	CNPRICED	AS	CoNsumer PRICE Difference from base
I	b	F	TDPRICE%	AT	TraDe PRICE % change from base
I	b	F	SUPPLY%	AU	SUPPLY quantity % change from base
I	b	F	PRPRICE%	AV	PRoducer PRICE % change from base
I	b	F	DEMAND%	AW	DEMAND quantity % change from base
I	b	F	CNPRICE%	AX	CoNsumer PRICE % change from base
I	b	F	NTRADE%	AY	Net TRADE quantity % change from base
P	s	N	PBSE	AZ	Producer Budget Subsidy Equivalent rate (price unit)
P	s	N	CBSE	BA	Consumer Budget Subsidy Equivalent rate (price unit)
I	b	F	PSURPLUS	BB	Producer SURPLUS change (total)
I	b	F	CSURPLUS	BC	Consumer SURPLUS change
I	b	F	GDPVAL	BD	Gross Domestic Product VALue (at LWDPRICE)
I	b	F	FARMVAL	BE	FARM VALue (at MKPRICE)
I	b	F	GOVTEXPD	BF	GOVernmenT EXPenDiture change from base (because of liberalization)
I	b	F	NEWGEXPD	BG	NEW Government EXPenDiture from base (from remaining support)
I	b	F	WELFARE	BH	total WELFARE change
I	b	N	MKPRICE	BI	MarKet PRICE at producer level
I	b	N	CQRENT	BJ	Change in Quota RENT
P	s	N	PTAXE	BK	Producer TAX Equivalent (of supply controls)
I	b	F	MPSURPLUS	BL	Minimum (excluded) Producer SURPLUS change
I	b	F	LSHRPSW	BM	Liberalized SHaRe of dPSW (used for welfare calculation)
I	b	F	LSHRCSW	BN	Liberalized SHaRe of CSW (used for welfare calculation)
I	b	F	LSHRMSW	BO	Liberalized SHaRe of MSW (used for welfare calculation)
I	b	F	LSHRESW	BP	Liberalized SHaRe of ESW (used for welfare calculation)
B	t	N	BGREXP	BQ	Base GRoss EXPorts
B	t	N	BGRIMP	BR	Base GRoss IMPorts
I	b	F	LGREXP	BS	Liberalized (estimated) GRoss EXPorts
I	b	F	LGRIMP	BT	Liberalized (estimated) GRoss IMPorts
B	f	N	BWDPRICE	BU	Base WorlD PRICE
I	b	F	BNTRADEV	BV	Base Net TRADE Value (using base world price)
I	b	F	LNTRADEV	BW	Liberalized Net TRADE Value (using lib. world price)
I	b	F	NTRADEVD	BX	Net TRADE Value Difference from base
I	b	F	BSELFSFR	BY	Base SELF SuFficiency Ratio
I	b	F	LSELFSFR	BZ	Liberalized SELF SuFficiency Ratio
P	s	N	MBSE	CA	IMport Budget Subsidy Equivalent rate (price unit)
P	s	N	EBSE	CB	Export Budget Subsidy Equivalent rate (price unit)
I	b	F	GREXPD	CC	GRoss EXPort quantity Difference from base
I	b	F	GRIMPD	CD	GRoss IMPort quantity Difference from base
I	b	F	GREXP%	CE	GRoss EXPort quantity % change from base
I	b	F	GRIMP%	CF	GRoss IMPort quantity % change from base
I	s	N	BQRENT	CG	Base Quota RENT
I	b	F	BDEMPC	CH	Base DEMand Per Capita
I	b	F	LDEMPC	CI	Liberalized (new) DEMand Per Capita
I	b	F	BPVALUE	CJ	Base Producer VALUE
I	b	F	PSUPPRT	CK	value of Producer SUPPoRT
O	b	F	PROJADJ	CL	PROJection ADJustment variable for projections
	b		.....	CM	(empty column)
O	b	N	SHNFED	CN	SHare of feeds Not FED in model
O	b	N	SHCONS	CO	SHare of intermediate product CONSumed in model
	b		.....	CP	(empty column)
I	b	F	EXTREVC	CQ	EXTra REVenue Change from price policies
O	b	N	SETSIDE	CR	SET-aSIDE shift variable when set-asides removed
I	s	N	PPRMAT	CS	Producer PRice Minus set-Aside Tax
P	s	N	MKSUPRT	CT	MarKet SUPport Rate
I	b	F	BCVALUE	CU	Base Consumption VALUE

Variables in the Country Base (b) Model Spreadsheet Which are Equations Carried into a World Model

Variables which are equations appearing in the country model spreadsheet and which are carried into a world model are listed below (marked as V in column I). The equations are in the corn (CN) row of the US page of the world DEMOWD model. For exposition, notation in addition to the above variable list is: PP - price, producer incentive, PC - price, consumer incentive, PW - price, world, and LIBSHR - percent liberalization (share) carried out. DEMO model nomenclature is used to mark cross prices (CN for corn, etc.). Note that not all of the supply or demand equation is necessarily contained in the supply equation (SUPPLYEQ) or demand equation (DEMANDEQ) cell. Each of these cells

contains references to other cells which contain parts of the equation. For programming purposes, it was convenient to split equations into parts, putting the parts in different cells. This allowed, for example, the constant term for the equation to be isolated in one cell which, in turn, facilitated the programming required to re-calculate the constant term.

The notation used for the equations is that of SuperCalc 5. * means times, / means divided by, and ^ means exponentiation. Note that in the equations, the elasticities are given as numbers, not references to cells in the elasticity matrices. The program EQUATION inserts the actual elasticities into the equations thus making the equation rows self-contained for transferral into a world model. Also recall that although the equations listed below are in terms of variable names, in SWOPSIM spreadsheets, they only appear as cell references. This makes for compact models which solve quickly.

```
Variable   Equation Calculating the Variable

DCROSSO  = 1*QSDM^.15
LPRPRICE = MAX(PRCONST-PRSUBW+IMSUBW-EXSUBW+TDCONST*(XRATE*PWCN)^(CTRAN.EL*WDPT.EL),1)+TRADEOQ
LCNPRICE = MAX(LPRPRICE+PRSUBW+CNSUBW+CNCONST,1)
SCROSS   = 1*PPWH^-.1*PPCG^-.06*PPSB^-.07
DCROSS   = 1*PCWH^.05*PCCG^.1*PCSM^.02*PCOM^.01*Z74^.01*QSBF^.21*QSPK^.25*QSML^.001*QSPM^.11*QSPE^.08
SUPPLYEQ = (1+SSHIFT+LIBSHR*SETSIDE)*SCONST*SCROSS*SCROSSO*LPRPRICE^.48
DEMANDEQ = (1+DSHIFT)*DCONST*DCROSS*DCROSSO*LCNPRICE^-.8
NTRADEEQ = SUPPLYEQ-DEMANDEQ
```

Indicator Equations in the Country Base (b) Model Spreadsheet

Many variables in the country model spreadsheet are indicators (marked as I in column I). These equations are used when simulation output is generated. Many calculate simple changes or percentage changes. Others, such as the surplus calculations associated with welfare measures, are more complicated; for example, the surplus calculations integrate area under the constant elasticity supply and demand schedules. In these cases, the equations contain elasticities and must be re-initialized with the program EQUATION whenever elasticities are changed. Note that for many indicators, a small number is sometimes added to the denominator of an equation; this prevents division by zero if another variable in the denominator equals zero, and the cell is not marked by an "ERROR" eyesore.

```
Variable    Indicator Equation

SUPPLYD   = SUPPLYEQ-SUPPLY
DEMANDD   = DEMANDEQ-DEMAND
NTRADED   = NTRADEEQ-NTRADE
PRPRICED  = LPRPRICE-PRPRICE
CNPRICED  = LCNPRICE-CNPRICE
TDPRICE%  = ((TDCONST*(XRATE*WDPRICE)^(CTRAN.EL*WDPT.EL))-TDPRICE)*100/TDPRICE
SUPPLY%   = SUPPLYD*100/(.0001+SUPPLY)
PRPRICE%  = PRPRICED*100/PRPRICE
DEMAND%   = DEMANDD*100/(.0001+DEMAND)
CNPRICE%  = CNPRICED*100/CNPRICE
NTRADE%   = NTRADED*100/(1+NTRADE)
PSURPLUS  = (.001/(1.6*XRATE))*(LPRPRICE*SUPPLYEQ-((PRPRICE+LSHRPSW*PTAXE)*SUPPLY))
            +LSHRPSW*.001*PTAXE*SUPPLY/XRATE
CSURPLUS  = (-.001/(.3*XRATE))*(LCNPRICE*DEMANDEQ-(CNPRICE*DEMAND)-((MAX(CNPRICE,LCNPRICE))^.3)
            *((DEMANDEQ/(LCNPRICE^-.7))-(DEMAND/(CNPRICE^-.7))))
GDPVAL    = WDPRICE*SUPPLYEQ*(1-SHNFED-SHCONS)/1000
FARMVAL   = MKPRICE*SUPPLYEQ/1000
GOVTEXPD  = -.001*(LSHRPSE*PBSE*SUPPLY+LSHRCSW*CBSE*DEMAND+LSHRMSQ*MBSE*BGRIMP+LSHRESW*EBSE*BGREXP)
NEWGEXPD  = .001*((1-LSHRPSW)*PBSE*SUPPLYD+(1-LSHRCSW)*CBSE*DEMANDD+(1-LSHRMSW)*(MBSE*GRIMPD)+(1-LSHRESW)
            *(EBSE*GREXPD))+EXTREVC
WELFARE   = MPSURPLS+CSURPLUS-GOVTEXPD-NEWGEXPD+CQRENT
MKPRICE   = TDPRICE*(1+TDPRICE%/100)+(1-LSHRPSW)*MKSUPRT
CQRENT    = (((1-CTRAN.EL*WDPT.EL)*(WDPRICE-BWDPRICE)+(1-LSHRCSW)*(CSW-CBSE)
            *IF((NTRADEEQ/(NTRADE+.001))<0,0,1))*.001*NTRADEEQ)-BQRENT
```

```
MPSURPLUS = PSURPLUS-(.001/(1.6*XRATE))*((.5*MIN(PPRMAT,LPRPRICE))^1.6)*((SUPPLYEQ/(LPRPRICE^.6))
            -(SUPPLY/(PPRMAT^.6)))
LSHRPSW   = PRSUBW/(DPSW+.00001)
LSHRCSW   = CNSUBW/(CSW+.00001)
LSHRMSW   = IMSUBW/(MSW+.00001)
LSHRESW   = EXSUBW/(ESW+.00001)
LGREXP    = MAX(BGREXP+NTRADED*((BGREXP+.5)/(BGREXP+BGRIMP+1)),0)-MIN(BGRIMP
            -NTRADED*(BGRIMP+.5)/(BGREXP+BGRIMP+1),0)
LGRIMP    = MAX(BGRIMP-NTRADED*((BGRIMP+.5)/(BGREXP+BGRIMP+1)),0)
            -MIN(BGREXP+NTRADED*(BGREXP+.5)/(BGREXP+BGRIMP+1),0)
BNTRADEV  = BWDPRICE*NTRADE/1000
LNTRADEV  = WDPRICE*NTRADEEQ/1000
NTRADEVD  = LNTRADEV-BNTRADEV
BSELFSFR  = SUPPLY/DEMAND
LSELFSFR  = SUPPLYEQ/DEMANDEQ
GREXPD    = LGREXP-BGREXP
GRIMPD    = LGRIMP-BGRIMP
GREXP%    = (LGREXP-BGREXP)*100/(BGREXP+1)
GRIMP%    = (LGRIMP-BGRIMP)*100/(BGRIMP+1)
BDEMPC    = 1000*DEMAND/(1+POPULATION)
LDEMPC    = 1000*DEMANDEQ/(1+(POPULATION*((1+P1)^AG1)))
BPVALUE   = PRPRICE*SUPPLY/1000
PSUPPRT   = .001*SUPPLYEQ*((1-LSHRPSW)*DPSW-(1-LSHRMSW)*MSW+(1-LSHRESW)*ESW)
PPRMAT    = PRPRICE+LSHRPSW*PTAXE
BCVALUE   = CNPRICE*DEMAND/1000
```

Variables/Data in the Country Support (s) Spreadsheet

The country support spreadsheet uses some of the country base data along with support information to calculate price support wedges, model prices, and budget data. The spreadsheet also calculates many other variables which are indicators or checks on the calculations but which are not used in the country base model spreadsheet. The following list gives a brief description of the variables/data for the top and bottom halves of the country support spreadsheet. The variable descriptions are from the cells below the variable names in the SWOPSIM support template spreadsheet NAMEWORK. A listing of the formulas follows the variable definitions. Variables carried into the country model spreadsheet carry the same name in the country support spreadsheet. Historically, the country support spreadsheet served as a check on support information input into SWOPSIM models; its ad-hoc organization reflects the many changes made in these checks over time.

Top Half of Country Support (s) Spreadsheet

Variable Name	Col. Let.	Variable Description and Mnemonic
WDPRICE	B	WorlD PRICE
SUPPLY	C	SUPPLY (production)
DEMAND	D	Domestic DEMAND (consumption) + stock change
NTRADE	E	Net TRADE = SUPPLY - DEMAND = BGEXP - BFIMP
PRSHARE	F	PRoducer SHARE of retail cost
BGREXP	G	Base GRoss EXPorts
BGRIMP	H	Base GRoss IMPorts
NTRADET	I	Net TRADE from Trade data = BGREXP - BGRIMP
DNTRADE	J	Difference check for NTRADE between columns E and I (NTRADE and NTRADET)
CMKPRICE	K	Calculated MarKet PRICE
PRIPRICE	L	calculated PRoducer Incentive PRICE
CNIPRICE	M	calculated CoNsumer Incentive PRICE
DTDPRICE	N	Derived (calculated) TraDe PRICE
PSCPB	P	Producer Support Commodity Program agriculture Budget (no associated price wedge)
PSCPBPW	Q	Producer Support Commodity Program agriculture Budget with Price Wedge
PSCPOPW	R	Producer Support Commodity Program Other related financial with Price Wedge
PSCPPW	S	Producer Support Commodity Program Price Wedge (no associated budget)
CCT	T	Computed Consumer Transfer to producer by quota or similar policy (consumer payment MUST be entered in column AG)
PSOPB	U	Producer Support Other (non-commodity) Program non agriculture Budget (no associated price w edge)

PSOPBRW	V	Producer Support Other (non-commodity) Program non agriculture Budget with Price Wedge
PSOPOPW	W	Producer Support Other (non-commodity) Program Other related financial with Price Wedge
PSOPPW	X	Producer Support Other (non-commodity) Program Price Wedge (no associated budget)
CYMS	Z	CopY of Market Support
SCNTRADE	AA	Second Copy of Net TRADE
MSTYPE	AB	Market Support TYPE choice variable (1=quota, 2=export tax/subsidy, 3=import tax)
CSCPB	AD	Consumer Support Commodity Program agriculture Budget (no associated price wedge)
CSCPBPW	AE	Consumer Support Commodity Program agriculture Budget with Price Wedge
CSCPOPW	AF	Consumer Support Commodity Program Other related financial with Price Wedge
CSCPPW	AG	Consumer Support Commodity Program Price Wedge (no associated budget)
CSOPB	AI	Consumer Support Other (non-commodity) Program non agriculture Budget (no associated price wedge)
CSOPBPW	AJ	Consumer Support Other (non-commodity) Program non agriculture Budget with Price Wedge
CSOPOPW	AK	Consumer Support Other (non-commodity) Program Other related financial with Price Wedge
CSOPPW	AL	Consumer Support Other (non-commodity) Program Price Wedge (no associated budget)
ESCPB	AR	Export Support Commodity Program agriculture Budget (no associated price wedge)
ESCPBPW	AS	Export Support Commodity Program agriculture Budget with Price Wedge
ESCPOPW	AT	Export Support Commodity Program Other related financial with Price Wedge
ESCPUPW	AU	Export Support Commodity Program Unused Price Wedge
ESOPB	AW	Export Support Other (non-commodity) Program non agriculture Budget (no associated price wedge)
ESOPBPW	AX	Export Support Other (non-commodity) Program non agriculture Budget with Price Wedge
ESOPOPW	AY	Export Support Other (non-commodity) Program Other related financial with Price Wedge
ESOPUPW	AZ	Export Support Other (non-commodity) Program Unused Price Wedge
ISCPB	BF	Import Support Commodity Program agriculture Budget (no associated price wedge)
ISCPBPW	BG	Import Support Commodity Program agriculture Budget with Price Wedge
ISCPOPW	BH	Import Support Commodity Program Other related financial with Price Wedge
ISCPUPW	BI	Import Support Commodity Program Unused Price Wedge
ISOPB	BK	Import Support Other (non-commodity) Program non agriculture Budget (no associated price wedge)
ISOPBPW	BL	Import Support Other (non-commodity) Program non agriculture Budget with Price Wedge
ISOPOPW	BM	Import Support Other (non-commodity) Program Other related financial with Price Wedge
ISOPUPW	BN	Import Support Other (non-commodity) Program Unused Price Wedge
PFACTOR	BQ	Price conversion FACTOR to convert to US Situation and Outlook price units
QFACTOR	BR	Quantity conversion FACTOR to convert to US Situation and Outlook quantity units
GAELC	BT	Gross Agricultural Expenditures in Local Currency
GAEM$	BU	Gross Agricultural Expenditures in Million US $
NTGELC	BV	Non Trade Government Expenditures in Local Currency
NTGEM$	BW	Non Trade Government Expenditures in Million US $
ATEELC	BX	Agricultural Trade Expenditure on Exports in Local Currency
ATEILC	BY	Agricultural Trade Expenditure on Exports in Local Currency
ATETLC	BZ	Agricultural Trade Expenditure Total in US $
MBSE	CA	iMport Budget Subsidy Equivalent--CARRIED INTO COUNTRY MODEL
EBSE	CB	Export Budget Subsidy Equivalent--CARRIED INTO COUNTRY MODEL
PBSE	CC	Producer Budget Subsidy Equivalent--CARRIED INTO COUNTRY MODEL
CBSE	CD	Consumer Budget Subsidy Equivalent--CARRIED INTO COUNTRY MODEL
BQRENT	CE	Base Quota economic RENT--CARRIED INTO COUNTRY MODEL
BQRENT%	CF	Base Quota RENT percent
TSP	CH	Total Support to Producer = PSE * Production
TSC	CI	Total Support to Consumer = CSE * Consumption
CTP	CJ	Consumer Transfer Portion of producer support
PSSH	CK	Producer Support SHare of PSE
ESSH	CL	Export Support SHare of PSE
MSSH	CM	iMport Support SHare of PSE
MVP	CN	Market Value of Production in M US$
PSPV	CO	Production Share of total Producer Value
PSPS	CP	Product Share of total Producer Support
PSAE	CQ	Product Share of total Agriculture Expenditures
TTSPSE	CR	Trade Tax Share of PSE
SHCV	CS	product SHare of Consumption Value
VC	CT	Value of Consumption in M US$
RTDS	CV	Relative TDS as percent
TPS	CY	Total Producer Support
TCS	CZ	Total Consumer Support
SUPELAS	DA	own-price SUPply ELASticity used for TDS
DEMELAS	DB	own-price DEMand ELASticity used for TDS
TDSMSP	DC	Trade Distorted by Support from Market Support to Producer
TDSMSC	DD	Trade Distorted by Support from Market Support to Consumer
TDSDSP	DE	Trade Distorted by Support from Direct Support to Producer
TDSOSA	DF	Trade Distorted by Support from Offset from Set Aside
TDSDSC	DG	Trade Distorted by Support from Direct Support to Consumer
TDS	DH	Trade Distorted by Support = TDSMSP+TDSSMSC+TDSDSP+TDSOSA+TDSDSC

Bottom Half of Country Support (s) Spreadsheet

Variable Name	Col. Let.	Variable Description and Mnemonic
DPSW	B	Distorting Producer Subsidy Wedge--CARRIED INTO COUNTRY MODEL
CSW	C	Consumer Subsidy Wedge--CARRIED INTO COUNTRY MODEL
ESW	D	Export Subsidy Wedge--CARRIED INTO COUNTRY MODEL
MSW	E	iMport Subsidy Wedge--CARRIED INTO COUNTRY MODEL
APROB	F	Aggregation PROBlem likely if marked with an A
DPSW%	G	DPSW as percent of producer price
CSW%	H	CSW as percent of consumer price
ESW%	I	ESW as percent of trade price
MSW%	J	MSW as percent of trade price
MKPRICE	K	MarKet PRICE (in US$/MT)--CARRIED INTO COUNTRY MODEL
PRPRICE	L	PRoducer incentive PRICE (PRIPRICE in US$/MT)--CARRIED INTO COUNTRY MODEL
CNPRICE	M	CoNsumer incentive PRICE (CNIPRICE in US$/MT)--CARRIED INTO COUNTRY MODEL
TDPRICE	N	derived TraDe PRICE (DTDPRICE in US$/MT)--CARRIED INTO COUNTRY MODEL
PSEIP%	P	Producer Subsidy Equivalent as percent of Internal Prices
CSEIP%	Q	Consumer Subsidy Equivalent as percent of Internal Prices
PSEWP%	R	Producer Subsidy Equivalent as percent of World Prices
CSEWP%	S	Consumer Subsidy Equivalent as percent of World Price
PSE	T	Producer Subsidy Equivalent
CSE	U	Consumer Subsidy Equivalent
MS	V	Market Support rate
CNTRADE	W	Copy of Net TRADE
WDP-DTDP	X	WorlD Price minus Derived TraDe Price
DTDP/WDP	Y	ratio of Derived TraDe Price to WorlD Price
SETSIDE	Z	SET-aSIDE supply shift when set-asides are removed--CARRIED INTO COUNTRY MODEL
SUPTAX	AA	SUPply TAX equivalent rate of SETSIDE (US$/MT)
PADJFACT	AB	Price ADJustment FACTor calculated if DTDPRICE is negative
OMIT	AD	1 if alternative non PSE data to be used, 0 = OMIT
ASUPPLY	AE	Alternative SUPPLY data (typically from PSE calculation)
ADEMAND	AF	Alternative DEMAND data (typically derived to match PSE supply data)
DIRPAY	AG	DIRect PAYments per metric ton (optional if non-PSE data used)
APRPRICE	AH	Alternative PRPRICE (typically from PSE calculation)
ACNPRICE	AI	Alternative CNPRICE
ATDPRICE	AJ	Alternative TDPRICE
MARGIN	AK	implied MARGIN
AEXPORTS	AL	Alternative gross EXPORTS
AIMPORTS	AM	Alternative gross IMPORTS
INTRADE	AN	If blank, Ignore Net TRADE and calculate both ESW and MSW, else 1
CEXPORTS	AO	Chosen EXPORT data used for calculations depending upon '1' in column AD
CIMPORTS	AP	Chosen IMPORT data used for calculations depending upon '1' in column AD
BPVALUE	AR	Base Production VALUE
BCVALUE	AS	Base Consumption VALUE
VPSUP	AT	Value of Producer SUPport
VCSUP	AU	Value of Consumer SUPport
VEXSUP	AV	Value of EXport SUPport
VIMSUP	AW	Value of IMport SUPport
TVPSUP	AX	Total Value of Producer SUPport
TVCSUP	AY	Total Value of Consumer SUPport
DPSNM	BA	Derived Producer Support from Non Model data
DCSNM	BB	Derived Consumer Support from Non Model data
PSDIF	BC	Producer Support DIFference between model and alternative data
CSDIF	BD	Consumer Support DIFference between model and alternative data
AMS	CU	Alternative Market Support
ADPS	CV	Alternative Direct Producer Support
AOPS	CW	Alternative Other Producer Support
ADCS	CX	Alternative Direct Consumer Support
MSQR	CY	Market Support if a Quantitative Restriction
MSES	CZ	Market Support if an Export Subsidy
MSIT	DA	Market Support if an Import Tax
VTDSMSP	DC	Value of Trade Distorted by Support from Market Support to Producer
VTDSMSC	DD	Value of Trade Distorted by Support from Market Support to Consumer
VTDSDSP	DE	Value of Trade Distorted by Support from Direct Support to Producer
VTDSOSA	DF	Value of Trade Distorted by Support from Offset from Set Aside
VTDSDSC	DG	Value of Trade Distorted by Support from Direct Support to Consumer
VTDS	DH	Value of Trade Distorted by Support = VTDSMSP+VTDSMSC+VTDSDSP+VTDSOSA+VTDSDSC

Variables in the Country Support (s) Spreadsheet as Equations or Numbers

The list below gives equations if variables are so calculated, otherwise numbers are shown. The numbers and equations are from the BF row of the DEMO support spreadsheet DEMOsUS. Again recall that in DEMOsUS, equations use only cell references but are shown below in terms of variable names for clarity. Note that in many equations, a small number is added to the denominator to prevent division by zero (and an ugly "ERROR" term if a denominator variable is zero).

Top Half of Country Support (s) Spreadsheet

Variable	Equations Calculate the Variable or Number (Where data is Entered in Support Spreadsheet or Put in by from Base Data Spreadsheet by Program WORK. Note that CSCAG3, etc. are 0 or 1 weights. Numbers are from BF row of DEMOsUS.)
WDPRICE	= 2567
SUPPLY	= 10655
DEMAND	= 11160
NTRADE	= SUPPLY-DEMAND
PRSHARE	= .55
BGREXP	= 482
BGRIMP	= 987
NTRADET	= BGEXP-BGIMP
DNTRADE	= NTRADE-NTRADET
CMKPRICE	= IF(APRPRICE=0,MS*EXCHANGE RATE+IF(ACNPRICE=0,IF(ATDPRICE=0,WDPRICE*EXCHANGE RATE,ATDPRICE),PRSHARE*ACNPRICE+CSE*EXCHANGE RATE),APRPRICE-DIRPAY)
PRIPRICE	= DTDPRICE+PSE*EXCHANGE RATE
CNIPRICE	= DTDPRICE-CSE*EXCHANGE RATE+CMKPRICE*((1/(PRSHARE+.00001))-1)
DTDPRICE	= CMKPRICE-(CCT*1000/(IF(AND(OMIT=1,ASUPPLY<>0),ASUPPLY,SUPPLY)+.000001))-(ESW-MSW)*EXCHANGE RATE
PSCPB	= 0
PSCPBPW	= ADPS*SUPPLY/(ASUPPLY+.0001)
PSCPOPW	= 0
PSCPPW	= 0
CCT	= -(CSCAG3*CSCPPW+CSOWAL3*CSOPPW)*IF(NTRADE<0,SUPPLY/DEMAND,1)
PSOPB	= 0
PSOPBRW	= AOPS*SUPPLY/(ASUPPLY+.0001)
PSOPOPW	= 0
PSOPPW	= 0
CYMS	= AMS
SCNTRADE	= NTRADE
MSTYPE	= 3
CSCPB	= 0
CSCPBPW	= ADCS*DEMAND/(ADEMAND+.0001)
CSCPOPW	= 0
CSCPPW	= IF(MSTYPE=1,-MSQR,0)
CSOPB	= 0
CSOPBPW	= 0
CSOPOPW	= 0
CSOPPW	= 0
ESCPB	= 0
ESCPBPW	= IF(MSTYPE=2,MSES,0)
ESCPOPW	= 0
ESCPUPW	= 0
ESOPB	= 0
ESOPBPW	= 0
ESOPOPW	= 0
ESOPUPW	= 0
ISCPB	= 0
ISCPBPW	= IF(MSTYPE=3,MSIT,0)
ISCPOPW	= 0
ISCPUPW	= 0
ISOPB	= 0
ISOPBPW	= 0
ISOPOPW	= 0
ISOPUPW	= 0
PFACTOR	= 22.0462
QFACTOR	= .45359290943564
GAELC	= .001*EXCHANGE RATE*(PBSE*SUPPLY+CBSE*DEMAND)+ATEELC+ATEILC
GAEM$	= GAELC/EXCHANGE RATE
NTGELC	= .001*EXCHANGE RATE*(PBSE*SUPPLY+CBSE*DEMAND)

```
NTGEM$     = NTGELC/EXCHANGE RATE
ATEELC     = .001*EXCHANGE RATE*EBSE*BGEXP
ATEILC     = .001*EXCHANGE RATE*MBSE*BGIMP
ATETLC     = (ATEELC+ATEILC)/EXCHANGE RATE
MBSE       = (ISCWBF3*ISCPB+ISCWBG3*ISCPBPW+ISCWBH3*ISCPOPW+ISOWBK3*ISOPB+ISOWBL3*ISOPBPW
             +ISOWBM3*ISOPOPW)*1000/(EXCHANGE RATE*IF(AND(OMIT=1,AIMPORTS<>0),AIMPORTS,BGIMP)+.000001)
EBSE       = (ESCWAR3*ESCPB+ESCWAS3*ESCPBPW+ESCWAT3*ESCPOPW+ESOWAW3*ESOPB+ESOWAX3*ESOPBPW
             +ESOWAY3*ESOPOPW)*1000/(EXCHANGE RATE*IF(AND(OMIT=1,AEXPORTS<>0),AEXPORTS,BGEXP)+.000001)
PBSE       = (PSCWP*PSCPB+PSCWQ*PSCPBPW+PSCWR*PSCPOPW+PSOWU*PSOPB+PSOWV*PSOPBPW+PSOWW*PSOPOPW)*1000
             /(EXCHANGE RATE*IF(AND(OMIT=1,ASUPPLY<>0),ASUPPLY,SUPPLY)+.000001)
CBSE       = (CSCWAD3*CSCPB+CSCWAE3*CSCPBPW+CSCWAF3*CSCPOPW+CSOWAI3*CSOPB+CSEWAJ3*CSOPBPW
             +CSOWAK3*CSOPOPW)*1000/(EXCHANGE RATE*IF(AND(OMIT=1,ADEMAND<>0),ADEMAND,DEMAND)+.000001)
BQRENT     = ((CSCPPW/EXCHANGE RATE)/(.00001+IF(AND(OMIT=1,ADEMAND<>0),ADEMAND,DEMAND)))*NTRADE
BQRENT%    = (BQRENT*1000/(.00001+(IF(SUPPLY<0,BGIMP,BGEXP)))*100)/(.00001+WDPRICE)
TSP        = PSE*SUPPLY/1000
TSC        = CSE*DEMAND/1000
CTP        = IF((-CSE/(PSE+.001))<0,0,MIN(-100*CSE/(PSE+.001),100))
PSSH       = 100*(DPSW)/(DPSW+ESW-MSW+.001)
ESSH       = 100*ESW/(DPSW+ESW-MSW+.001)
MSSH       = -100*MSW/(DPSW+ESW-MSW+.001)
MVP        = MKPRICE*SUPPLY/1000
PSPV       = MVP*100/(CN29+.000001)
PSPS       = 100*TSP/(CH29+.000001)
PSAE       = 100*GAEM$/(BU29+.000001)
TTSPSE     = (ESW-MSW)*100/(PSE+.000001)
SHCV2      = 100*VC/(CT29+.000001)
VC         = CNPRICE*DEMAND/1000
RTDS       = TDS*200/((SUPPLY-TDSMSP-TDSDSP-TDSOSA+.001)+(DEMAND+TDSMSC+TDSDSC+.001))
TPS        = .001*PSE*SUPPLY
TCS        = .001*CSE*DEMAND
SUPELAS    = .55
DEMELAS    = -.72
TDSMSP     = SUPELAS*SUPPLY*MS/(.001+MKPRICE)
TDSMSC     = -DEMELAS*DEMAND*MS/(.001+MKPRICE)
TDSDSP     = SUPELAS*SUPPLY*(PSE-MS)/(.001+MKPRICE)
TDSOSA     = -SETSIDE*SUPPLY
TDSDSC     = DEMELAS*DEMAND*(CSE+MS)/(.001+MKPRICE)
TDS        = SUM(DC6:DG6)

Bottom Half of Country Support (s) Spreadsheet

             Equation Calculation the Variable or Number (Where data is Entered in
             Support Spreadsheet or Put in by from Base Data Spreadsheet by Program
Variable     WORK. Note that CSCAG3, etc. are 0 or 1 weights.  Numbers are from BF row of DEMOsUS.)

DPSW       = (PSCWQ*PSCPBPW+PSCWR*PSCPOPW+PSEWS*PSCPPW+CCT+PSOWV*PSOPBPW+PSOWW*PSOPOPW
             +PSOWX*PSOPPW)*1000/(EXCHANGE RATE*IF(AND(OMIT=1,ASUPPLY<>0),ASUPPLY,SUPPLY)+.000001)
CSW        = (CSCWAE3*CSCPBPW+CSCWAF3*CSCPOPW+CSCAG3*CSCPPW+CSEWAJ3*CSOPBPW+CSOWAK3*CSOPOPW
             +CSOWAL3*CSOPPW)*1000/(EXCHANGE RATE*IF(AND(OMIT=1,ADEMAND<>0),ADEMAND,DEMAND)+.000001)
ESW        = IF(INTRADE*NTRADE<0,BGEXP/(BGEXP+BGIMP+.0001),1)*(ESCWAS3*ESCPBPW+ESCWAT3*ESCPOPW
             +ESCWAU3*ESCPUPW+ESOWAX3*ESOPBPW+ESOWAY3*ESOPOPW+ESOWAZ3*ESOPUPW)*1000/(EXCHANGE
             RATE*CEXPORTS+.000001)
MSW        = IF(INTRADE*NTRADE>0,BGIMP/(BGEXP+BGIMP+.0001),1)*(ISCWBG3*ISCPBPW+ISCWBH3*ISCPOPW
             +ISCWBI3*ISCPUPW+ISOWBL3*ISOPBPW+ISOWBM3*ISOPOPW+ISOWBN3*ISOPUPW)*1000/(EXCHANGE
             RATE*CIMPORTS+.000001)
APROB      = IF(OR(AND(NTRADE<0,ESW<>0),AND(NTRADE>0,MSW<>0)),"A"," ")
DPSW%      = DPSW*100/(PRPRICE+.000001)
CSW%       = CSW*100/(CNPRICE+.000001)
ESW%       = ESW*100/(TDPRICE+.000001)
MSW%       = MSW*100/(TDPRICE+.000001)
MKPRICE    = (CMKPRICE/EXCHANGE RATE)+PADJFACT
PRPRICE    = (PRIPRICE/EXCHANGE RATE)+PADJFACT
CNPRICE    = (CNIPRICE/EXCHANGE RATE)+PADJFACT
TDPRICE    = (DTDPRICE/EXCHANGE RATE)+PADJFACT
PSEIP%     = 100*(DPSW+ESW-MSW)/(PRPRICE+.000001)
CSEIP%     = 100*(CSW-ESW+MSW)/(CNPRICE+.000001)
PSEWP%     = 100*(DPSW+ESW-MSW)/(WDPRICE+.000001)
CSEWP%     = 100*(CSW-ESW+MSW)/(WDPRICE+.000001)
PSE        = DPSW+ESW-MSW
CSE        = CSW-ESW+MSW
MS         = ESW-MSW+CCT*1000/(EXCHANGE RATE*(IF(AND(OMIT=1,ASUPPLY<>0),ASUPPLY,SUPPLY)+.000001))
CNTRADE    = NTRADE
WDP-DTDP   = WDPRICE-TDPRICE
DTDP/WDP   = (DTDPRICE/EXCHANGE RATE)/(WDPRICE+.00001)
SETSIDE    = 0
```

```
SUPTAX    = 0
PADJFACT  = IF(DTDP/WDP<.1,(.1-DTDP/WDP)*WDPRICE,IF(DTDP/WDP>2,(2-DTDP/WDP)*WDPRICE,0))
OMIT      = 0
ASUPPLY   = 10660
ADEMAND   = ASUPPLY*DEMAND/(SUPPLY+.0001)
DIRPAY    = 0
APRPRICE  = 2504
ACNPRICE  = 0
ATDPRICE  = 0
MARGIN    = IF(AND(APRPRICE<>0,ACNPRICE<>0),(APRPRICE-DIRPAY)/ACNPRICE,NA)
AEXPORTS  = 0
AIMPORTS  = 0
INTRADE   = 1
CEXPORTS  = IF(AND(OMIT=1,AEXPORTS<>0),AEXPORTS,BGEXP)
CIMPORTS  = IF(AND(OMIT=1,AIMPORTS<>0),AIMPORTS,BGIMP)
BPVALUE   = (IF(APRPRICE=0,PRPRICE*EXCHANGE RATE,APRPRICE))*(IF(ASUPPLY=0,SUPPLY,ASUPPLY))/1000
BCVALUE   = (IF(ACNPRICE=0,CNPRICE*EXCHANGE RATE,ACNPRICE))*(IF(ADEMAND=0,DEMAND,ADEMAND))/1000
VPSUP     = PSCWQ*PSCP3PW+PSCWR*PSCPOPW+CCT+PSOWV*PSOPBPW+PSOWW*PSOPOPW+PSOWX*PSOPPW
VCSUP     = CSCWAE3*CSCPBPW+CSCWAF3*CSCPOPW+CSCAG3*CSCPPW+CSEWAJ3*CSOPBPW+CSOWAK3*CSOPOPW+CSOWAL3*CSOPPW
VEXSUP    = ESCWAS3*ESCPBPW+ESCWAT3*ESCPOPW+ESCWAU3*ESCPUPW+ESOWAX3*ESOPBPW+ESOWAY3*ESOPOPW+ESOWAZ3*ESOPUPW
VIMSUP    = ISCWBG3*ISCPBPW+ISCWBH3*ISCPOPW+ISCWBI3*ISCPUPW+ISOWBL3*ISOPBPW+ISOWBM3*ISOPOPW+ISOWBN3*ISOPUPW
TVPSUP    = VPSUP+VEXSUP*(IF(ASUPPLY<>0,ASUPPLY,SUPPLY)/(.000001+CEXPORTS))-VIMSUP
              *(IF(ASUPPLY<>0,ASUPPLY,SUPPLY)/(.000001+CIMPORTS))
TVCSUP    = VCSUP-VEXSUP*(IF(ADEMAND<>0,ADEMAND,DEMAND)/(.000001+CEXPORTS))+VIMSUP
              *(IF(ADEMAND<>0,ADEMAND,DEMAND)/(.000001+CIMPORTS))
DPSNM     = TVPSUP*100/(.000001+BPVALUE)
DCSNM     = TVCSUP*100/(.000001+BCVALUE)
PSDIF     = PSEIP%-DPSNM
CSDIF     = CSEIP%-DCSNM
AMS       = 470
ADPS      = 203
AOPS      = 1804
ADCS      = 153
MSQR      = AMS*DEMAND/(.001+ASUPPLY)
MSES      = AMS*BGEXP/(.001+ASUPPLY)
MSIT      = -AMS*BGIMP/(.001+ASUPPLY)
VTDSMSP   = .001*TDSMSP*WDPRICE
VTDSMSC   = .001*TDSMSC*WDPRICE
VTDSDSP   = .001*TDSDSP*WDPRICE
VTDSOSA   = .001*TDSOSA*WDPRICE
VTDSDSC   = .001*TDSDSC*WDPRICE
VTDS      = SUM(DC37:DG37)
```

A few of the variables in the support spreadsheet are carried over into the country model spreadsheet with the program SUPPORT. These basically are incentive prices which base off of a market price and use support price wedges, and budget price wedges which are used to track government expenditures. Many of the variables are checks on the support data. For example, PSE's are calculated from the support data so that the user can compare spreadsheet PSE's with published ones. Other variables check on the budget data.

While the current version of the support spreadsheet is designed to take PSE components directly, other parts of the spreadsheet offer other options for entering support information. The spreadsheet is designed to allow the user to classify support as "hard" or "soft" and selectivly exclude support components from a PSE and price wedge calculation. A complete listing of a support worksheet is found in an appendix of a SWOPSIM overview document (76).

An extra set of information on measures of trade distorted by support (TDS) at the far right of the support spreadsheet (see Roningen and Dixit, 74). The TDS measures are calculated from average elasticities and support component information in the spreadsheet. The measures give an indication of what the initial impact will be during the first iteration of a SWOPSIM model using the support information in the spreadsheet. A final extra set of information in standard 22-product SWOPSIM support spreadsheets is a set of aggregations of support PSE's and CSE's.

Appendix B--Documentation of DEMO, the Demonstration Model

This appendix gives a brief documentation for DEMO, the demonstration model discussed in the text. A complete listing of the spreadsheets of one country in DEMO can be found in Roningen, Dixit, Hart, and Sullivan (76). The documentation shown below is of the standard type produced by the programs EOUT and BOUT (see Appendix C of this report). First, a copy of the master model file DEMO.CAL is presented which holds product and country definitions.

The Master Model File

```
DEMO     Master model file for DEMOnstration model - 1989 base

   US EC RW - - - - - - - - -

 BF  D  D  D IU . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 PK  D  D  D IU . . . . . . . . . .                                        .
 ML  D  D  D IU . . . . . . . . . .  CODE   DEMO COUNTRY/REGION       TL89 COUNTRY/REGION   .
 PM  D  D  D IU . . . . . . . . . .                                        .
 PE  D  D  D IU . . . . . . . . . .   US    United States             US                .
 DM  D  D  D IB IN NT . . . . . . .   EC    European Community (12)   EC                .
 DB  D  D  D IU OU . . . . . . . .    RW    Rest of World             CN WE JP AU NZ    .
 DC  D  D  D IU OU . . . . . . . .                                    BZ AR DO TH ML PH .
 DP  D  D  D IU OU . . . . . . . . . . . . . . . . . . .              EE SV CH SK TW EA .
 WH  1  1  1  I  . . .                                  . . . .       SF MX CA VE LA NG AF .
 CN  1  1  1  I  . . .  SECTOR CODES                    . . . .       EG MP MO ND OS SA RW .
 CG  1  1  1  I  . . .                                  . . . .                         .
 RI  1  1  1  . . . .   IU    Input Using sector        . . . . . . . . . . . . . . .
 SB  1  1  1  I IN . .   I    Input (e.g. feed)         . . . . . . . . . . . . . . .
 SM  D  D  D IB OU . .  IB    Both Input and Input using sector . . . . . . . . . . . . . . .
 SO  D  D  D IU OU . .                                  . . . . . . . . . . . . . . .
 OS  1  1  1  I IN . .  IN    intermediate demand INput . . . . . . . . . . . . . . .
 OM  D  D  D IB OU . .  IO    intermediate demand OUtput . . . . . . . . . . . . . .
 OO  D  D  D IU OU . .                                  . . . . . . . . . . . . . . .
 CT  1  1  1  . . . .   NT    Non-Traded product        . . . . . . . . . . . . . . .
 SU  1  1  1  . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 TB  1  1  1  . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  ^ . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
```

CODE DEFINITION OF MATRIX CELL CODES

CODE	DEFINITION
.	No equation created for this country/region & product (however, note that RW region MUST have equations for all products to close world model).
1	Supply and demand equations created for this country/region & product.
S	Supply and demand equations created AND demand quantity for this country/region & product can be included in any SUPPLY equation.
D	Supply and demand equations created AND supply quantity for this country/region & product can be included in any DEMAND equation.
SD or DS	Supply and demand equations created AND demand quantity for this country/region & product can be included in any SUPPLY equation AND supply quantity for this country/region & product can be included in any DEMAND equation.

> The heart of the master model file is the set of codes marking whether or not an equation set exists for a product and country (and if the variable calculated by the equation is to be used for intermediate demand). The other key element is the world reference price in column AR. Other information is just documentation of codes, documentation of the source of the reference prices, and any other useful information.

CODE	PRODUCT GROUP-----	CODE	PRODUCT GROUP------
BF	BeeF and veal	CG	other Coarse Grains
PK	PorK	RI	RIce
ML	Mutton and Lamb	SB	SoyBeans
PM	Poultry - Meat	SM	SoyMeal
PE	Poultry - Eggs	SO	SoyOil
DM	Dairy - fresh Milk	OS	Other oilSeeds
DB	Dairy - Butter	OM	Other Meals
DC	Dairy - Cheese	OO	Other Oils
DP	Dairy - milk Powder	CT	CoTton
WH	WHeat	SU	SUgar
CN	CorN	TB	ToBacco

TLIB data set source:

FAS Commodity Supply and Utilization data

ERS Commodity Support data

> The codes for products and countries must be two capital letters. It is helpful to put the full product and country names in the master model files along with the mnemonics used.

	1989 World price WDPRICE	----Published price---- 0 1987	0 1988	1 1989	Product used for world price	Unit Unit
BF	2567	108.18	114.17	116.46	Beef	US cents/lb.
PK	2176	2375.84	2129.03	2176.28	Pork	US$/MT
ML	2321	98.45	109.45	105.32	Lamb	US cents/lb.
PM	1039	1061.39	1133.65	1039.19	Poultry Meat	US$/MT
PE	1696	1478.86	1660.78	1696.86	Poultry Eggs	US$/MT
DM	272	11.23	11.03	12.37	Milk - whole	US$/MT
DB	2866	113.49	140.56	130.00	Butter	US cents/lb.
DC	3009	3244.83	3148.92	3009.81	Cheese	US$/MT
DP	2326	79.26	80.24	105.51	Milk Powder	US$/lb.
WH	169	3.07	3.95	4.61	Wheat	US$/bu.
CN	111	1.92	2.72	2.83	Maize	US$/bu
CG	105	72.82	98.46	105.94	Sorghum	US$/MT
RI	320	229.75	301.50	320.33	Rice	US$/MT
SB	275	215.75	303.50	275.00	Soybeans	US$/MT
SM	247	203.25	267.50	247.33	Soybean Meal	US$/MT
SO	431	334.25	463.42	431.50	Soybean Oil	US$/MT
OS	630	933.02	650.00	630.00	Groundnuts	US$/MT
OM	200	161.92	209.42	200.42	Groundnut Cake	US$/MT
OO	774	499.80	590.50	774.80	Groundnut Oil	US$/MT
CT	1674	74.77	63.52	75.95	Cotton	US cents/lb.
SU	282	6.76	10.19	12.81	Sugar	US cents/lb.
TB	3844	157.21	162.59	174.37	Tobacco	US cents/lb.

^

The "1" above 1989 selects that year for the world reference prices in column AR. World reference prices are taken from published sources and are documented in ERS SWOPSIM models. The product set in DEMO is used in many SWOPSIM models and covers about 80% of U.S. agricultural production. Conversion factors in the master model file allow the prices to be entered in published units and converted to metric units. Metric units are used because the FAS global database is metric.

CODE	COUNTRY/REGION IN TL89 DATABASE -------	IN DEMO MODEL
--DC---	Developed Countries----------	
US	United States	US
CN	CaNada	RW
EC	European Community	EC
WE	other Western Europe	RW
JP	JaPan	RW
AU	AUstralia	RW
NZ	New Zealand	RW
SF	South AFrica	RW
--CP---	Centrally Planned countries----------	
EE	Eastern Europe	RW
SV	SoViet Union	RW
CH	CHina (Peoples' Republic)	RW
--LA---	Latin America----------	
MX	MeXico	RW
CA	Central America & Caribbean	RW
BZ	BraZil	RW
AR	ARgentina	RW
VE	VEnezuela	RW
LA	other Latin America	RW
--ME---	Subsaharan Africa & Middle East--------	
NG	NiGeria	RW
AF	Other subsaharan AFrica	RW
EG	EGypt	RW
MP	Middle East & N. Africa - oil Producers	RW
MO	Middle East & N. Africa - O. countries	RW
--AS---	ASia----------	
ND	INDia	RW
OS	Other South Asia	RW
DO	InDOnesia	RW
TH	THailand	RW
ML	MaLaysia	RW
PH	PHilippines	RW
SA	other Southeast Asia	RW
SK	South Korea	RW
TW	TaiWan	RW
EA	other East Asia	RW

DEMO is an aggregation of a large 33-country global model and data set. SWOPSIM programs AGMOD, AGDAT, and AGSUP allow the user to aggregate models (elasticities), base data, and support data, respectively. The codes to the left show which 33 countries were aggregated into DEMO countries. This kind of reference documentation should always be put into a master model file so a record is maintained of the source of data.

Since small models solve much faster than large ones and produce less output, it often is convenient to construct a series of smaller ones once a large balanced global data set has been prepared. Remember that the last region in ANY SWOPSIM model MUST have the two letter code RW (standing for the residual rest-of-the-world. The RW region in the 33-country model (a residual) is put into the RW region in DEMO along with all countries except the US and the EC-12.

The DEMO model is useful for rough and quick analysis of US and EC policy interactions with an assumed response from the rest of the world. A major decision to make about a large RW region in a model like DEMO is what kind of price transmission to assume since RW includes market economies with a response to world prices and developing/ socialist ones with none.

Factor used for conversion to U.S.$/MT	Source	1989
22.0462	IFS - 76kb - All Origins (US Ports)	BF
1	FATUS - United States (Import Unit Value)	PK
22.0462	IFS - 76pf - New Zealand (London)	ML
1	FATUS - United States (Export Unit Value)	PM
1	FATUS - United States (Export Unit Value)	PE
22.0462	ERS - New Zealand (CONSTRUCTED product prices)	DM
22.0462	IFS - 76fl - New Zealand (Lond.-1984, CONST. 85,86)	DB
1	FATUS - U.S. (Import Unit Value-1986, CONST. 85,86)	DC
22.0462	United States (Average Price-1984, CONST. 85,86)	DP
36.7437	IFS - 76d - United States (US Gulf Ports)	WH
39.368	IFS - 76j - United States (US Gulf Ports)	CN
1	IFS - 76tr - United States (US Gulf Ports)	CG
1	IFS - 76h - Thailand (Bangkok)	RI
1	IFS - 76jf - United States (Rotterdam)	SB
1	IFS - 76jj - United States (Rotterdam)	SM
1	IFS - 76ji - All Origins (Dutch Ports)	SO
1	IFS - 76bh - Nigeria (London)	OS
1	IFS - 76bj - All Origins (Europe)	OM
1	IFS - 76bj - West Africa (Europe)	OO
22.0462	IFS - 76f - Liverpool Index	CT
22.0462	IFS - 76ia - Caribbean (New York)	SU
22.0462	IFS - 76m - United States (All Markets)	TB
		^

IFS - International Financial Statistics from the International Monetary Fund - Washington, D.C.

FAO - United Nations Food and Agriculture Organization - Rome

ERS - Economic Research Service - U.S. Department of Agriculture - Washington, D.C.

FAS - Foreign Agricultural Service - U.S. Department of Agriculture - Washington, D.C.

International data sources are used for world reference prices in DEMO and other ERS standard 22-product SWOPSIM models. Market prices in country models are typically from country sources unless nothing is available (then world reference prices are used as a proxy).

Country market prices, combined with support price wedges and fixed margin assumptions yield producer and consumer incentive prices in models which are, in turn, linked to the world reference prices when a global model is created.

If world reference prices are changed during the construction of a model, they must be changed manually in the master model file as well as the country model files that have been created (the world prices are inserted into country model files when they are created).

A full set of base data, support, and model spreadsheets can be seen in an appendix in the overview document for SWOPSIM (74). The following pages in this appendix show the elasticities printed with the program EOUT and the base data (quantity and support) printed with the program BOUT. Each of these programs uses templates created to collect the information from the source spreadsheets and to present the information in a concise manner that fits on a page. Once the basic economic structure of standard SWOPSIM models is understood, a user can "read" the model by looking at the elasticity matrices produced by EOUT (or its customized equivalent CUSEOUT) and the base data printout produced by BOUT (or the customized program CUSBOUT).

The top elasticity matrix for DEMO gives supply elasticities, while the bottom one gives the elasticities for demand. Feed share elasticities appear at the bottom (left) of the page. Feed ratios (bottom right of the page) implied by the feed shares and base data give the user a check on the feed shares themselves.

The base data page for DEMO includes all of the key information that is used to initialize a model at the base period. The top half of the page gives base quantity and price data, while the bottom half gives support information in the form of model price wedges, PSE's, and CSE's. Summary information is presented at the bottom of the base data page. The variable names used in the model appear above the data columns along with verbal descriptions. Consult Appendix A for variable definitions.

The product names along with their mnemonic codes are given on each page.

Supply Elasticity Matrix for --> DEMObUS 1989

ELASTICITIES

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum
BF	.60	-.01				.02					-.06	-.01			-.01								.52
PK	-.03	1.00		-.01						-.01	-.35	-.06			-.14			-.02					.37
ML			.80								-.03	-.02											.75
PM		-.01		.65	-.02					-.02	-.08	-.01			-.09			-.01					.41
PE				-.05	.55					-.02	-.12	-.02			-.06			-.01					.27
DM	.03					.50					-.05	-.01			-.01								.45
DB						-.16	.55	-.65	.31														.05
DC						-.16	-.14	.42	-.08														.05
DP						-.16	.55	-.65	.31														.05
WH										.60	-.25	-.06		.05			-.01				-.01		.33
CN										-.10	.48	-.06		-.07									.25
CG										-.15	-.40	.99		-.09			-.03						.32
RI													.40										.40
SB										.04	-.14	-.03		.60						-.11		-.01	.35
SM														-.27	.20	.12							.05
SO														-.27	.20	.12							.05
OS										-.11		-.12					.55			-.08			.24
OM																	-.27	.15	.17				.05
OO																	-.27	.15	.17				.05
CT														-.27			-.02			.74			.46
SU										-.04											.50		.46
TB														-.05								.25	.20

	Self Suffic. Ratio
BF	.95
PK	.96
ML	.86
PM	1.04
PE	1.02
DM	1.00
DB	1.13
DC	.96
DP	1.57
WH	2.46
CN	1.45
CG	1.35
RI	1.87
SB	1.47
SM	1.22
SO	1.13
OS	1.04
OM	.90
OO	.66
CT	2.77
SU	.83
TB	1.09

Value (Million US$) of	Production	Exports
BF	26883	1186
PK	9257	157
ML	376	5
PM	11193	470
PE	4720	95
DM	19695	0
DB	1613	138
DC	7745	15
DP	919	242
WH	8784	4528
CN	21902	5313
CG	3274	755
RI	1648	557
SB	10725	3425
SM	4168	749
SO	2596	307
OS	821	72
OM	415	24
OO	471	192
CT	4372	2156
SU	2171	116
TB	2003	806

Demand Elasticity Matrix for --> DEMObUS 1989

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum	S-D Sum	
BF	-.70	.05		.03																			-.62	1.14	BF
PK	.13	-.86	.01	.03																			-.69	1.06	PK
ML		.18	-.70																				-.52	1.27	ML
PM	.08	.03		-.56																			-.45	.86	PM
PE					-.35																		-.35	.62	PE
DM						-.16	.01	.03															-.12	.57	DM
DB							-.63																-.63	.68	DB
DC								-.60															-.60	.65	DC
DP									-.65														-.65	.70	DP
WH										-.49	.15	.04											-.30	.62	WH
CN										.05	-.80	.10			.02			.01			.01		-.61	.86	CN
CG										.09	.64	-1.38			.01			.01					-.64	.96	CG
RI													-.25										-.25	.65	RI
SB														-.30	.15	.09							-.05	.40	SB
SM											.06				-.83			.04					-.73	.78	SM
SO																-.37			.15				-.22	.27	SO
OS																	-.34	.13	.14				-.07	.31	OS
OM											.23	.04			.26			-1.25					-.73	.78	OM
OO																.49			-.69				-.20	.25	OO
CT																				-.20			-.20	.66	CT
SU											.02										-.24		-.22	.67	SU
TB																						-.20	-.20	.40	TB

Product definition and mnemonic:

BF	BeeF and veal
PK	PorK
ML	Mutton and Lamb
PM	Poultry Meat
PE	Poultry, Eggs
DM	Dairy - fluid Milk
DB	Dairy - Butter
DC	Dairy - Cheese
DP	Dairy - milk Powder
WH	WHeat
CN	CorN
CG	other Coarse Grains
RI	RIce
SB	SoyBeans
SM	SoyMeal
SO	SoyOil
OS	Other oilSeeds
OM	Other Meals
OO	Other Oils
CT	CoTton
SU	SUgar (refined)
TB	ToBacco

Shares of Product Going to Intermediate Demand for --> DEMObUS

Supply-->	SBF	SPK	SML	SPM	SPE	SDM	SDB	SDC	SDP	SSM	SSO	SOM	SOO	Row Sum	Final Dem. Share	Final Dem. Elas.	
DM							.09	.42	.07					.58	.42	-.20	DM
WH	.05	.03		.07	.04	.03								.22	.78	-.20	WH
CN	.21	.25		.11	.08	.15								.80	.20	-.20	CN
CG	.24	.27	.01	.11	.08	.16								.87	.14	-.20	CG
SB										.77	.18			.95	.05	-.30	SB
SM	.11	.31		.36	.12	.10								1.00		-.20	SM
OS												.47	.23	.70	.30	-.34	OS
OM	.11	.31		.36	.12	.10								1.00		-.20	OM

Feed Ratios (Unit feed/animal product) implied by feed shares & base data

	SBF	SPK	SML	SPM	SPE	SDM	
...Total for all feeds in model...							
	3.44	6.50	1.55	2.67	3.88	.40	All
.....Grains feeds in model.....							
	.11	.09	.00	.16	.22	.01	WH
	2.59	4.58	.84	1.45	2.56	.30	CN
	.50	.84	.71	.25	.44	.05	CG
.....Soymeal in model.....							
	.21	.87	.00	.73	.59	.03	SM
.....Other meals in model.....							
	.03	.11	.00	.09	.07	.00	OM

Date printed	8/22/1991
Last update	4/15/1991
Base year ---------->	1989
Exchange rate (LC/US$)	1
Transmission elast.	1.0
Income growth rate	.0180
Population growth rate	.0076
Income (Million US$)	4466515
Population (1000)	247132
Per Capita Income ($)	18073
Model spreadsheet --->	DEMObUS

Elasticities for --> DEMObUS

Supply Elasticity Matrix for --> DEMObEC 1989

ELASTICITIES

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum		Self Suffic. Ratio	Value (Million US$) of Production	Exports
BF	.55	-.07				.15				-.01	-.01	-.02			-.01								.58	BF	1.05	28376	2125
PK	.10	.90		-.01						-.13	-.06	-.11			-.08			-.04					.37	PK	1.03	19356	534
ML			.70			-.08				-.02	-.01	-.02			-.01								.55	ML	.85	5851	15
PM		-.02		.80	-.04					-.04	-.04	-.08			-.06			-.03					.50	PM	1.06	10181	403
PE				-.07	.75					-.12	-.08	-.16			-.15			-.08					.09	PE	1.01	5979	92
DM	.13		-.01			.65				-.03	-.02	-.04			-.03			-.02					.63	DM	1.00	33821	0
DB						-.20	.35	-.35	.25														.05	DB	1.20	6120	451
DC						-.20	-.13	.47	-.09														.05	DC	1.07	16591	493
DP						-.20	.35	-.35	.25														.05	DP	1.26	4318	316
WH										.50	-.05	-.15					-.05				-.01		.25	WH	1.35	14637	3604
CN										-.15	.60	-.22											.23	CN	.98	5031	256
CG										-.22	-.11	.70					-.03				-.01		.33	CG	1.16	9890	1156
RI													.35										.35	RI	.88	545	93
SB														.40			-.10						.30	SB	.14	1362	4
SM														-.23	.20	.08							.05	SM	.55	2480	284
SO														-.23	.20	.08							.05	SO	1.42	954	328
OS										-.14		-.06		-.03			.75						.52	OS	.81	5159	17
OM																	-.27	.07	.25				.05	OM	.51	1202	84
OO																	-.27	.07	.25				.05	OO	.82	4318	45
CT																				.14			.14	CT	.26	531	99
SU										-.01		-.02									.15		.12	SU	1.24	5291	1333
TB																						.20	.20	TB	.58	1365	554

Demand Elasticity Matrix for --> DEMObEC 1989

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum	S-D Sum		Product definition and mnemonic:
BF	-.70	.20	.01	.02																			-.48	1.06	BF	BeeF and veal
PK	.26	-.80	.02	.03																			-.49	.86	PK	PorK
ML	.02	.07	-.90	.10																			-.70	1.25	ML	Mutton and Lamb
PM	.06	.06	.06	-.90																			-.72	1.22	PM	Poultry Meat
PE					-.20																		-.20	.29	PE	Poultry, Eggs
DM						-.16	.02	.05	.01														-.08	.71	DM	Dairy - fluid Milk
DB							-.43		.01														-.42	.47	DB	Dairy - Butter
DC								-.40	.02														-.38	.43	DC	Dairy - Cheese
DP							.01	.10	-.40														-.28	.33	DP	Dairy - milk Powder
WH										-.57	.06	.07	.01										-.43	.67	WH	WHeat
CN										.17	-1.06	.26			.01			.01					-.60	.84	CN	CorN
CG										.12	.15	-.91			.01			.01					-.63	.95	CG	other Coarse Grains
RI										.13			-.50										-.37	.72	RI	RIce
SB														-.16	.08	.03							-.05	.35	SB	SoyBeans
SM											.01	.02			-.89			.10					-.76	.81	SM	SoyMeal
SO																-.59			.40				-.19	.24	SO	SoyOil
OS																	-.35	.07	.24				-.05	.57	OS	Other oilSeeds
OM											.02	.03			.19			-1.00					-.76	.81	OM	Other Meals
OO																.05			-.56				-.51	.56	OO	Other Oils
CT																				-.52			-.52	.66	CT	CoTton
SU																					-.50		-.50	.62	SU	SUgar (refined)
TB																						-.50	-.50	.70	TB	ToBacco

Shares of Product Going to Intermediate Demand for --> DEMObEC

Supply-->	SBF	SPK	SML	SPM	SPE	SDM	SDB	SDC	SDP	SSM	SSO	SOM	SOO	Row Sum	Final Dem. Share	Final Dem. Elas.	
DM							.17	.44	.15					.76	.24	-.20	DM
WH	.04	.17	.01	.03	.06	.09								.40	.60	-.20	WH
CN	.08	.23	.02	.10	.12	.17								.72	.28	-.20	CN
CG	.09	.24	.02	.10	.13	.19								.77	.23	-.20	CG
SB										.79	.17			.97	.03	-.16	SB
SM	.06	.31	.01	.13	.21	.28								1.00		-.20	SM
OS												.52	.48	1.00		-.35	OS
OM	.06	.31	.01	.13	.21	.28								1.00		-.20	OM

Feed Ratios (Unit feed/animal product) implied by feed shares & base data

SBF	SPK	SML	SPM	SPE	SDM	
...Total for all feeds in model...						
1.42	2.97	2.19	2.17	3.93	.25	All
.....Grains feeds in model.....						
.31	.80	.54	.29	.72	.05	WH
.29	.50	.50	.45	.66	.04	CN
.58	.92	.88	.79	1.27	.08	CG
.....Soymeal in model.....						
.15	.45	.17	.39	.78	.05	SM
.....Other meals in model.....						
.10	.30	.11	.26	.51	.03	OM

Date printed	8/22/1991
Last update	7/26/1991
Base year ---------->	1989
Exchange rate (LC/US$)	1
Transmission elast.	1.0
Income growth rate	.0167
Population growth rate	.0017
Income (Million US$)	3632933
Population (1000)	324766
Per Capita Income ($)	11186
Model spreadsheet --->	DEMObEC

Elasticities for --> DEMObEC

Supply Elasticity Matrix for --> DEMObRW 1989

ELASTICITIES

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum	Self Suffic. Ratio
BF	.37	.03		-.01		.04				-.01	-.02	-.02											.33	BF 1.01
PK	-.03	.54		-.01						-.04	-.08	-.05			-.01			-.02					.31	PK 1.00
ML	-.04		.46			-.02				-.02	-.04	-.05						-.01					.26	ML 1.05
PM	-.02	-.01		.67						-.03	-.08	-.06			-.02			-.03					.42	PM .96
PE					.42					-.04	-.04	-.05			-.02			-.02					.26	PE 1.00
DM	.03					.32				-.01	-.01	-.01						-.01					.31	DM 1.00
DB						-.10	.22	-.11	.04														.05	DB .93
DC						-.10	-.19	.38	-.04														.05	DC .96
DP						-.10	.22	-.11	.04														.05	DP .78
WH										.34	-.04	-.04	-.02				-.02			-.01			.21	WH .88
CN										-.07	.37	-.05	-.02	-.01			-.01						.20	CN .80
CG										-.07	-.05	.41	-.01	-.01			-.03						.25	CG .94
RI										-.01	-.01		.28				-.01			-.01			.25	RI .99
SB										.01	-.03	-.01	-.01	.44			-.06			-.02	-.02		.30	SB .92
SM														-.32	.15	.22							.05	SM 1.12
SO														-.32	.15	.22							.05	SO .85
OS										-.04	-.01	-.03	-.02	-.03			.30			-.01			.14	OS 1.02
OM																	-.16	.03	.19				.05	OM 1.18
OO																	-.16	.03	.19				.05	OO 1.06
CT										-.02			-.03	-.01			-.02			.34	-.01		.24	CT .95
SU										-.01			-.01	-.01							.34		.30	SU .98
TB																						.18	.18	TB 1.04

Value (Million US$) of

	Production	Exports
BF	70133	5393
PK	64410	2148
ML	7280	1158
PM	27270	1063
PE	26643	197
DM	86814	0
DB	12558	621
DC	7409	388
DP	2497	305
WH	53906	5581
CN	30301	890
CG	32308	1020
RI	95135	2305
SB	12898	2072
SM	4793	3864
SO	7144	694
OS	27978	1780
OM	7569	1773
OO	57313	8095
CT	18024	4486
SU	29410	4169
TB	20273	1862

Demand Elasticity Matrix for --> DEMObRW 1989

	BF	PK	ML	PM	PE	DM	DB	DC	DP	WH	CN	CG	RI	SB	SM	SO	OS	OM	OO	CT	SU	TB	Row Sum	S-D Sum
BF	-.52	.09	.01	.04		.01				-.01			-.01										-.39	.72
PK	.09	-.48		.02																			-.37	.67
ML	.06	.01	-.45	.05																			-.33	.59
PM	.09	.05	.01	-.61		.05	.01			-.01	-.01	-.01	-.05										-.46	.88
PE					-.37	.02																	-.36	.61
DM	.01				.01	-.18	.01			-.01			-.01										-.16	.47
DB	.02		.01		.01		-.34			-.02	-.01	-.02	-.02			.01			.04				-.30	.35
DC	.02						.01	-.37															-.34	.39
DP	.03			.01	.01		.01	.01	-.38			-.01	-.01										-.33	.38
WH	-.01					-.01				-.33	.03	.02	.04										-.27	.49
CN										.06	-.64	.17	.01		.02			.01					-.37	.57
CG	-.01				-.01		-.01			.05	.20	-.63	.02		.01			.01					-.37	.62
RI	-.01					-.01				.02			-.29										-.28	.53
SB														-.35	.12	.17							-.06	.36
SM											.18	.08			.78			.07					-.45	.50
SO							.01						-.01			-.54			.15				-.39	.44
OS																	.43	.04	.34				-.05	.19
OM											.05	.04			.04			.56					-.43	.48
OO							.01									.02			.46				-.43	.48
CT																				.31			-.32	.56
SU																					.39		-.39	.69
TB													.01									.23	-.24	.41

Product definition and mnemonic:

BF	BeeF and veal
PK	PorK
ML	Mutton and Lamb
PM	Poultry Meat
PE	Poultry, Eggs
DM	Dairy - fluid Milk
DB	Dairy - Butter
DC	Dairy - Cheese
DP	Dairy - milk Powder
WH	WHeat
CN	CorN
CG	other Coarse Grains
RI	RIce
SB	SoyBeans
SM	SoyMeal
SO	SoyOil
OS	Other oilSeeds
OM	Other Meals
OO	Other Oils
CT	CoTton
SU	SUgar (refined)
TB	ToBacco

Shares of Product Going to Intermediate Demand for --> DEMObRW

Supply-->	SBF	SPK	SML	SPM	SPE	SDM	SDB	SDC	SDP	SSM	SSO	SOM	SOO	Row Sum	Final Dem. Share	Final Dem. Elas.	
DM							.17	.16	.06					.40	.60	-.20	DM
WH	.02	.05		.01	.03	.03								.14	.86	-.20	WH
CN	.08	.24	.02	.08	.06	.08								.56	.44	-.20	CN
CG	.10	.17	.02	.07	.09	.10								.55	.45	-.20	CG
SB														.85	.15	-.35	SB
SM	.07	.23	.01	.19	.19	.21				.70	.16			.91	.09	-.20	SM
OS														1.00		-.43	OS
OM	.05	.25	.02	.14	.17	.23						.54	.46	.85	.15	-.20	OM

Feed Ratios (Unit feed/animal product) implied by feed shares & base data

	SBF	SPK	SML	SPM	SPE	SDM	
...Total for all feeds in model...							
	2.25	3.52	2.99	3.31	2.66	.29	All
.....Grains feeds in model.....							
	.26	.53	.36	.33	.53	.05	WH
	.91	1.63	1.06	1.36	.74	.09	CN
	.94	1.02	1.35	1.04	.92	.10	CG
.....Soymeal in model.....							
	.08	.16	.08	.33	.24	.02	SM
.....Other meals in model.....							
	.06	.18	.14	.25	.22	.03	OM

Date printed	8/22/1991
Last update	4/15/1991
Base year ---------->	1989
Exchange rate (LC/US$)	1
Transmission elast.	.5
Income growth rate	.0278
Population growth rate	.0176
Income (Million US$)	9063280
Population (1000)	4529416
Per Capita Income ($)	2001
Model spreadsheet --->	DEMObRW

Elasticities for --> DEMObRW

US 1989	Base Quantity Data (1000 MT) Prod. SUPPLY	Cons. DEMAND	P-C=E-I NTRADE	Exports EXPORTS	Imports IMPORTS	Base Price Data (US$/MT) World WDPRICE	Market MKPRICE	Producer PRPRICE	Consumer CNPRICE	Trade TDPRICE	Producer share C. PRSHARE	Base Values (M. US$) Prod. BPVALUE	Cons. BCVALUE	G. Exp. GAEM$	Projection parameters & Price Trans. SUPGROW	INCELAS	Elast. PTELAS		Product definition and mnemonic:	Trade D. M US$ VTDS
BF	10655	11160	-505	482	987	2567	2504	2523	4539	2460	.55	26883	50655	312	.004	.16	.65	BF	Beef & veal	603
PK	7176	7461	-285	122	407	2176	1290	1290	2576	1290	.50	9257	19222	27	.014	.05	1.00	PK	PorK	-22
ML	157	182	-25	2	27	2321	2394	2394	4788	2381	.50	376	871			.13	.90	ML	Mutton & Lamb	4
PM	9984	9558	426	426		1039	1113	1121	2015	1103	.55	11193	19261	166	.018	.11	1.00	PM	Poultry Meat	146
PE	4104	4031	73	83	10	1696	1150	1150	1909	1140	.60	4720	7694	32	.001	.05	1.00	PE	Poultry, Eggs	29
DM	65432	65432				272	301	301	595	260	.50	19695	38946	443	.009	-.01	.20	DM	Dairy - fluid Milk	
DB	572	506	66	68	2	2866	2820	2820	3376	2026	.80	1613	1708	129	.009	.10	.20	DB	Dairy - Butter	245
DC	2531	2649	-118	7	125	3009	3060	3060	4229	2199	.70	7745	11203	377	.009	.35	.20	DC	Dairy - Cheese	1360
DP	395	251	144	145	1	2326	2326	2326	2720	1671	.80	919	683	142	.009	.38	.20	DP	Dairy - Powder	89
WH	55406	22486	32920	33557	637	169	140	159	198	135	.70	8784	4445	1249	.019	-.18	1.00	WH	WHeat	123
CN	191198	131556	59642	59693	51	111	89	115	99	89	.90	21902	13002	4892	.017	-.12	1.00	CN	CorN	1230
CG	30245	22397	7848	9208	1360	105	82	108	91	82	.90	3274	2041	794	.010	-.08	1.00	CG	o. Coarse Gr.	210
RI	5010	2675	2335	2497	162	320	223	329	438	223	.50	1648	1171	553	.023	.14	.80	RI	RIce	-3
SB	52439	35665	16774	16874	100	275	203	205	214	203	.95	10725	7617	84	.021	.20	1.00	SB	SoyBeans	45
SM	24518	20119	4399	4404	5	247	170	170	212	170	.80	4168	4275		.021	.33	1.00	SM	SoyMeal	0
SO	5743	5086	657	680	23	431	452	452	904	452	.50	2596	4598		.021		1.00	SO	SoyOil	0
OS	6900	6642	258	607	349	630	119	119	132	119	.90	821	878		.022	.15	1.00	OS	O. oilSeeds	0
OM	2242	2487	-245	131	376	200	185	185	231	185	.80	415	575		.022	.33	1.00	OM	O. Meals	0
OO	1068	1612	-544	435	979	774	441	441	882	441	.50	471	1422		.022		1.00	OO	Other Oils	0
CT	2655	957	1698	1698		1674	1270	1647	2540	1270	.50	4372	2431	1000	.011	.40	1.00	CT	CoTton	333
SU	6089	7379	-1290	463	1753	282	356	357	712	250	.50	2171	5254	3	.005	.04	.20	SU	SUgar	395
TB	559	514	45	225	180	3844	3583	3583	7166	3583	.50	2003	3683		.010	.22	1.00	TB	ToBacco	0

US 1989	Model Price Wedges (US $/MT) DPSW	CSW	ESW	MSW	Model Price Wedges (%) DPSW%	CSW%	ESW%	MSW%	Producer and Consumer Subsidy Equivalent Rates % Internal Price PSEIP%	CSEIP%	% World Price PSEWP%	CSEWP%	US $/MT PSE	CSE	Mkt. S. MS	Budget Wedges (US $/MT) Import MBSE	Export EBSE	Prod. PBSE	Cons. CBSE	Set-aside P. Share S-SIDE	US $/MT SUPTAX
BF	19	14		-44	.8	.3		-1.8	2.5	-.7	2.5	-1.2	63	-30	44	-44		19	14		
PK		4				.1				.1		.2		4					4		
ML				-13				-.6	.5	-.3	.6	-.6	13	-13	13	-13					
PM	8	8	10		.7	.4	.9		1.6	-.1	1.7	-.2	18	-2	10		10	8	8		
PE		8	10			.4	.9		.9	-.1	.6	-.1	10	-2	10		10		8		
DM	41	-34			13.5	-5.7			13.5	-5.7	14.9	-12.4	41	-34	41				7		
DB		149	794			4.4	39.2		28.1	-19.1	27.7	-22.5	794	-645	794		794		149		
DC	861	-719			28.1	-17.0			28.1	-17.0	28.6	-23.9	861	-719	861				142		
DP		188	655			6.9	39.2		28.1	-17.2	28.1	-20.1	655	-467	655		655		188		
WH	19	2	5		11.7	1.2	3.7		14.9	-1.4	14.0	-1.6	24	-3	5		5	19	2	.09	-35
CN	26				22.3	.1			22.3	.1	23.0		26					26		.07	-22
CG	26				24.3				24.3		25.0		26					26		.11	-22
RI	106	8			32.2	1.9			32.2	1.9	33.1	2.6	106	8				106	8	.22	-129
SB	2				.7	.1			.7	.1	.6		2					2			-12
SM																					
SO																					
OS																					-15
OM																					
OO																					
CT	377				22.9				22.9		22.5		377					377		.10	-319
SU	106	-106			29.8	-14.9			29.8	-14.9	37.7	-37.5	106	-106	106			1			-7
TB																					

Summary of support (%):	Support Measures PSE	CSE	Value share of- Prod.	Cons.	Share of- Produc. Support	Agric. Budget	Source- Consumer Transfer
Meat & eggs	1.7	-.3	38.0	48.5	5.7	5.3	28
Dairy	18.5	-8.7	21.9	26.1	35.3	10.7	83
Food crops	17.1	-.7	6.5	2.8	11.7	17.7	10
Feed crops	22.6		14.2	7.5	36.2	55.7	
Oilseeds, prod.	.4		13.9	9.6	.5	.8	
Other crops	18.8	-6.9	5.5	5.6	10.5	9.8	29
Animal Products	7.8	-3.3	59.9	74.5	41.1	16.0	48
Crops, oilseeds	13.5	-1.6	40.1	25.5	58.9	84.0	6
All products	11.4	-2.8	100.0	100.0	100.0	100.0	31

Summary of base information:	Million US $
Production Value	145749
Market Value	137146
Consumption Value	201634
Government Expenditures	10203
Producer Support	15684
Consumer Transfer	-5703
Total TDS Estimate	4788

Last update 8/13/91
Date printed 8/22/91

Base model spreadsheet --> DEMObUS
Support spreadsheet -----> DEMOsUS

Exchange rates in:
Model spreadsheet 1
Support spreadsheet 1
Currency unit per US$ US$
Base year ----------> 1989

Base data ----------> DEMObUS

EC	Base Quantity Data (1000 MT)					Base Price Data (US$/MT)					Producer	Base Values (M. US$)			Projection parameters				Product	Trade D.
	Prod.	Cons.	P-C=E-I	Exports	Imports	World	Market	Producer	Consumer	Trade	share C.	Prod.	Cons.	G. Exp.	& Price	Trans.	Elast.		definition	M US$
1989	SUPPLY	DEMAND	NTRADE	EXPORTS	IMPORTS	WDPRICE	MKPRICE	PRPRICE	CNPRICE	TDPRICE	PRSHARE	BPVALUE	BCVALUE	GAEM$	SUPGROW	INCELAS	PTELAS		and mnemonic:	VTDS
BF	7457	7128	329	819	490	2567	3735	3805	6791	2594	.55	28376	48403	1459	.012	.18	.10	BF	BeeF & veal	7516
PK	12404	12064	340	416	76	2176	1560	1560	3121	1284	.50	19356	37650	115	.017	.25	.60	PK	PorK	4822
ML	1086	1283	-197	7	204	2321	3928	5388	7856	2209	.50	5851	10079	1234	.012	.21	.10	ML	Mutton & Lamb	2523
PM	6030	5689	341	457	116	1039	1688	1688	3070	881	.55	10181	17464	369	.020	.27	.60	PM	Poultry Meat	3631
PE	4888	4841	47	96	49	1696	1223	1223	2039	958	.60	5979	9869	25	.009	.25	.60	PE	Poultry, Eggs	971
DM	108870	108870				272	310	311	604	270	.50	33821	65749	1871	.011	.05	.05	DM	Dairy - fluid Milk	
DB	1699	1415	284	366	82	2866	3602	3602	4503	1232	.80	6120	6371	868	.011	.18	.05	DB	Dairy - Butter	1113
DC	4387	4098	289	381	92	3009	3782	3782	5403	1293	.70	16591	22140	948	.011	.35	.05	DC	Dairy - Cheese	3351
DP	1477	1173	304	316	12	2326	2923	2923	3654	1000	.80	4318	4286	608	.011	.33	.05	DP	Dairy - Powder	617
WH	78576	58302	20274	22774	2500	169	195	186	278	158	.70	14637	16203	199	.019	-.12	.15	WH	WHeat	1935
CN	26529	26964	-435	2065	2500	111	194	190	208	124	.90	5031	5597	-75	.021	-.05	.25	CN	CorN	1377
CG	55191	47664	7527	8527	1000	105	184	179	204	136	.90	9890	9730	161	.010	-.05	.10	CG	o. Coarse Gr.	2523
RI	1324	1506	-182	488	670	320	412	412	813	190	.50	545	1225	-133	.014	.21		RI	RIce	106
SB	1948	14140	-12192	7	12199	275	502	699	529	502	.95	1362	7477	383	.040	.21	.30	SB	SoyBeans	226
SM	10041	18099	-8058	1148	9206	247	247	247	309	247	.80	2480	5588		.040	.21	.50	SM	SoyMeal	0
SO	2214	1556	658	762	104	431	431	431	862	431	.50	954	1341		.040	.14	.50	SO	SoyOil	0
OS	9038	11137	-2099	43	2142	630	399	571	443	399	.90	5159	4935	1555	.020	.21	.30	OS	O. oilSeeds	1026
OM	6012	11845	-5833	420	6253	200	200	200	250	200	.80	1202	2961		.020	.21	.50	OM	O. Meals	0
OO	5579	6840	-1261	58	1319	774	774	774	1548	774	.50	4318	10588		.020	.13	.50	OO	Other Oils	0
CT	317	1235	-918	59	977	1674	1674	1674	3348	1674	.50	531	4135		.016	.20	1.00	CT	CoTton	0
SU	14750	11888	2862	4219	1357	282	401	359	802	316	.50	5291	9532	-261	.019	.12	.10	SU	SUgar	505
TB	355	615	-260	144	404	3844	3844	3844	7688	3844	.50	1365	4728	18	.016	.37	1.00	TB	ToBacco	0

EC	Model Price Wedges (US $/MT)				Model Price Wedges (%)				Producer and Consumer Subsidy Equivalent Rates				Mkt. S.	Budget Wedges (US $/MT)			Set-aside P.
									% Internal Price		% World Price		US $/MT			Import	Export	Prod.	Cons.	Share	US $/MT
1989	DPSW	CSW	ESW	MSW	DPSW%	CSW%	ESW%	MSW%	PSEIP%	CSEIP%	PSEWP%	CSEWP%	PSE	CSE	MS	MBSE	EBSE	PBSE	CBSE	S-SIDE	SUPTAX
BF	70		1141		1.9		44.0		31.8	-16.8	47.2	-44.4	1211	-1141	1141		1141	70			
PK			277				21.5		17.7	-8.9	12.7	-12.7	277	-277	277		277				
ML	1460			-1719	27.1			-77.8	59.0	-21.9	137.0	-74.1	3179	-1719	1719	-1719		1460			
PM			808				91.7		47.8	-26.3	77.7	-77.7	808	-808	808		808				
PE			265				27.6		21.7	-13.0	15.6	-15.6	265	-265	265		265				
DM	41	-24			13.2	-4.0			13.2	-4.0	15.1	-8.8	41	-24	41					17	
DB			2370				192.4		65.8	-52.6	82.7	-82.7	2370	-2370	2370		2370				
DC			2489				192.4		65.8	-46.1	82.7	-82.7	2489	-2489	2489		2489				
DP			1924				192.4		65.8	-52.6	82.7	-82.7	1924	-1924	1924		1924				
WH	-9	1	37		-4.9	.4	23.5		15.1	-12.9	16.6	-21.3	28	-36	37		37	-9	1		
CN	-5	8		-70	-2.4	3.9		-56.5	34.6	-29.8	59.1	-55.8	66	-62	70	-70		-5	8		
CG	-5		48		-2.5		35.5		24.3	-23.6	41.6	-45.9	44	-48	48		48	-5			
RI		10		-221		1.2		-116.2	53.7	-26.0	69.1	-66.0	221	-211	221	-221				10	
SB	197				28.1				28.1		71.5		197					197			
SM																					
SO																					
OS	172				30.1				30.1		27.3		172					172			
OM																					
OO																					
CT																					
SU	-42	1	85		-11.8	.1	26.9		11.9	-10.6	15.1	-30.0	43	-85	85		85	-42	1		
TB																		50			

Summary of support (%):	Support Measures PSE	CSE	Value share of- Prod.	Cons.	Share of- Produc. Support	Agric. Budget	Source- Consumer Transfer
Meat & eggs	31.0	-15.8	37.4	40.3	41.2	34.3	92
Dairy	36.6	-18.7	33.6	32.2	41.6	46.0	77
Food crops	16.4	-13.9	8.8	5.7	4.7	.7	100
Feed crops	27.8	-25.9	8.4	5.0	7.7	.9	98
Oilseeds, prod.	10.1		7.5	10.7	3.6	20.7	
Other crops	9.0	-5.5	4.3	6.0	1.2	-2.6	76
Animal Products	33.7	-17.1	71.0	72.5	82.8	80.2	85
Crops, oilseeds	17.0	-8.8	29.0	27.5	17.2	19.8	70
All products	29.6	-14.8	100.0	100.0	100.0	100.0	80

Summary of base information:	Million US $
Production Value	183358
Market Value	180999
Consumption Value	306051
Government Expenditures	9345
Producer Support	53553
Consumer Transfer	-45351
Total TDS Estimate	32243

Last update 8/13/91
Date printed 8/22/91

Base model spreadsheet --> DEMObEC
Support spreadsheet -----> DEMOsEC

Exchange rates in:
Model spreadsheet 1
Support spreadsheet .86
Currency unit per US$ ECU
Base year ----------> 1989

Base data ----------> DEMObEC

RW	Base Quantity Data (1000 MT)					Base Price Data (US$/MT)					Producer	Base Values (M. US$)			Projection parameters			Product	Trade D.
1989	Prod. SUPPLY	Cons. DEMAND	P-C=E-I NTRADE	Exports EXPORTS	Imports IMPORTS	World WDPRICE	Market MKPRICE	Producer PRPRICE	Consumer CNPRICE	Trade TDPRICE	share C. PRSHARE	Prod. BPVALUE	Cons. BCVALUE	G. Exp. GAEM$	& Price Trans. SUPGROW	INCELAS	Elast. PTELAS	definition and mnemonic:	M US$ VTDS
BF	27425	27249	176	2861	1738	2567	2510	2557	4558	1885	.55	70133	124213	1546	.012	.36	.32	BeeF & veal	16750
PK	44797	44852	-55	1481	1129	2176	1416	1438	2787	1451	.50	64410	125004	2990	.022	.51	.09	PorK	-3504
ML	4932	4710	222	789	357	2321	1458	1476	2887	1468	.50	7280	13597	223	.007	.50	.34	Mutton & Lamb	-127
PM	17973	18740	-767	952	1239	1039	1508	1517	2741	1116	.55	27270	51372	172	.029	.57	.34	Poultry Meat	7911
PE	24951	25072	-120	216	541	1696	1054	1068	1742	914	.60	26643	43666	720	.015	.31	.19	Poultry, Eggs	3025
DM	265947	265947				272	311	326	619	201	.50	86814	164571	4844	.011	.31	.10	Dairy - fluid Milk	
DB	4391	4741	-350	441	402	2866	2705	2860	3381	1409	.80	12558	16030	681	.011	.53	.12	Dairy - Butter	2896
DC	4126	4297	-171	420	302	3009	1773	1796	2532	923	.70	7409	10881	96	.011	.50	.16	Dairy - Cheese	1756
DP	1628	2076	-448	382	545	2326	1534	1534	1917	799	.80	2497	3980		.011	.51	.18	Dairy - Powder	534
WH	402986	456180	-53194	42124	92375	169	130	134	182	132	.70	53906	83217	3054	.018	.27	.32	WHeat	-1135
CN	243764	302971	-59207	9307	69766	111	123	124	132	96	.90	30301	40072	1636	.019	.04	.40	CorN	6902
CG	253306	268681	-15375	10371	25607	105	117	128	129	98	.90	32308	34777	2807	.009	-.05	.38	o. Coarse Gr.	7304
RI	334304	336457	-2153	9412	11394	320	268	285	528	245	.50	95135	177801	8216	.019	.42	.16	RIce	7044
SB	51700	56282	-4582	8788	12660	275	230	249	236	236	.95	12898	13307	1328	.029	.01	.44	SoyBeans	96
SM	34599	30940	3659	17995	14438	247	139	139	164	215	.80	4793	5079		.029	.03	.49	SoyMeal	-4902
SO	7736	9051	-1315	2208	3300	431	923	923	1847	314	.50	7144	16716		.029	.65	.51	SoyOil	1064
OS	89388	87547	1841	5091	3502	630	303	313	321	350	.90	27978	28071	2211	.017	.28	.37	O. oilSeeds	-6367
OM	39411	33333	6078	9885	4188	200	192	192	242	179	.80	7569	8079		.017	.25	.41	O. Meals	523
OO	34177	32372	1805	12393	9659	774	1677	1677	3411	653	.50	57313	110418		.017	.73	.44	Other Oils	11584
CT	14583	15363	-780	3313	4330	1674	1219	1236	2369	1354	.50	18024	36402	1297	.012	.82	.30	CoTton	-2495
SU	84783	86355	-1572	22792	24768	282	337	347	668	183	.50	29410	57706	1369	.016	.39	.21	SUgar	5722
TB	5389	5174	215	882	637	3844	3762	3762	7592	2112	.50	20273	39283		.019	.61	.24	ToBacco	2895

RW	Model Price Wedges (US $/MT)				Model Price Wedges (%)				Producer and Consumer Subsidy Equivalent Rates						Mkt. S.	Budget Wedges (US $/MT)		Set-aside P.	
1989	DPSW	CSW	ESW	MSW	DPSW%	CSW%	ESW%	MSW%	% Internal Price PSEIP%	% Internal Price CSEIP%	% World Price PSEWP%	% World Price CSEWP%	US $/MT PSE	US $/MT CSE	MS	Import MBSE	Export EBSE	Prod. PBSE	Cons. CBSE	Share S-SIDE	US $/MT SUPTAX
BF	672	-620			26.3	-13.6			26.3	-13.6	26.2	-24.2	672	-620	625			47	9		
PK	-13	80			-.9	2.9			-.9	2.9	-.6	3.7	-13	80	-35			22	45		
ML	8	39			.6	1.3			.6	1.3	.4	1.7	8	39	-10			18	28		
PM	401	-391			26.4	-14.3			26.4	-14.3	38.6	-37.7	401	-391	391			10			
PE	154	-125			14.4	-7.2			14.4	-7.2	9.1	-7.4	154	-125	140			14	15		
DM	126	-107			38.5	-17.3			38.5	-17.3	46.2	-39.5	126	-107	110			16	2		
DB	1451	-1296			50.7	-38.3			50.7	-38.3	50.6	-45.2	1451	-1296	1296			155			
DC	872	-849			48.6	-33.5			48.6	-33.5	29.0	-28.2	872	-849	849			23			
DP	735	-735			47.9	-38.3			47.9	-38.3	31.6	-31.6	735	-735	735						
WH	1	6			1.0	3.2			1.0	3.2	.8	3.5	1	-6	-2			4	3		
CN	29	-23			23.1	-17.4			23.1	-17.4	25.9	-20.7	29	-23	27			1	4		
CG	29	-18			22.9	-14.0			22.9	-14.0	27.8	-17.3	29	-18	18			11			
RI	40	-15			14.0	-2.9			14.0	-2.9	12.4	-4.7	40	-15	24			16	8		
SB	14	11			5.5	4.9			5.5	4.9	5.0	4.2	14	11	-6			19	6		
SM	-76	85			-55.0	51.9			-55.0	51.9	-30.8	34.5	-76	85	-76						
SO	609	-609			66.0	-33.0			66.0	-33.0	141.3	-141.3	609	-609	609						
OS	-37	63			-11.7	19.6			-11.7	19.6	-5.8	10.0	-37	63	-47			10	15		
OM	13	-15			6.6	-6.2			6.6	-6.2	6.3	-7.5	13	-15	13						
OO	1024	-1081			61.0	-31.7			61.0	-31.7	132.3	-139.6	1024	-1081	1024						
CT	-118	203			-9.5	8.6			-9.5	8.6	-7.1	12.1	-118	203	-135			17	68		
SU	164	-148			47.3	-22.1			47.3	-22.1	58.1	-52.5	164	-148	154			9	7		
TB	1650	-1719			43.9	-22.6			43.9	-22.6	42.9	-44.7	1650	-1719	1650						

Summary of support (%):	Support Measures PSE	CSE	Value share of -Prod.	-Cons.	Share of Produc. Support	Agric. Budget	Source Consumer Transfer
Meat & eggs	14.8	-6.6	28.3	29.7	18.3	17.0	95
Dairy	40.8	-20.4	15.3	16.2	28.2	16.9	87
Food crops	9.2	-.9	20.9	21.7	8.7	34.0	24
Feed crops	23.0	-15.8	8.7	6.2	9.1	13.4	71
Oilseeds, prod.	30.3	-17.7	17.0	15.1	22.2	10.7	90
Other crops	31.1	-13.9	9.8	11.1	13.4	8.0	96
Animal Products	23.9	-11.5	43.6	45.9	46.6	34.0	92
Crops, oilseeds	21.5	-10.0	56.4	54.1	53.4	66.0	64
All products	23.2	-10.7	100.0	100.0	100.0	100.0	76

Summary of base information:	Million US $
Production Value	702069
Market Value	681261
Consumption Value	1204240
Government Expenditures	33189
Producer Support	157763
Consumer Transfer	-128549
Total TDS Estimate	57477
Last update	8/13/91
Date printed	8/22/91

Base model spreadsheet -->	DEMObRW
Support spreadsheet ----->	DEMOsRW
Exchange rates in:	
Model spreadsheet	1
Support spreadsheet	1
Currency unit per US$	US$
Base year ---------->	1989
Base data ---------->	DEMObRW

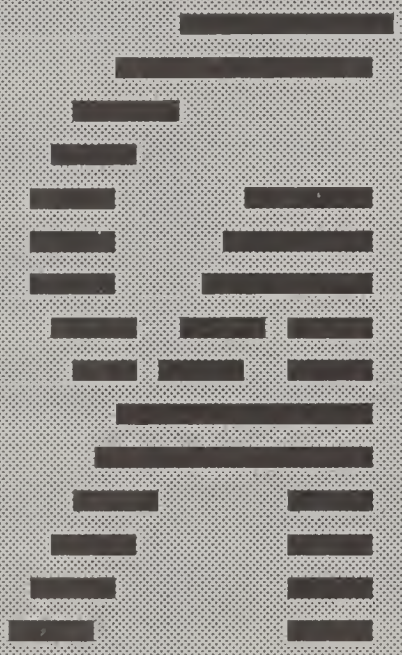
Appendix C--A SWOPSIM Tutorial SWOPTUT (and SWOPARM), Annotated

The SWOPSIM program installation disk contains a tutorial program SWOPTUT that carries a user though the creation of a small world net trade model called SMAL. The tutorial program creates the model SMAL, enters data, initializes country spreadsheet models, builds a world model, simulates the world model, and prepares an output of the results. When the tutorial is completed, the files for the models will exist on the C:\SMAL subdirectory. A second tutorial, SWOPARM, does the same thing for an Armington bilateral trade flow model. Each tutorial takes about half an hour to complete.

This part of the documentation presents most of the explanatory screens from the tutorial program SWOPTUT along with a few screens that are significantly different for SWOPARM. The screens are represented by the shaded parts of the pages and include both informational screens generated by the tutorial as well as screens from SWOPSIM programs and SuperCalc 5 spreadsheet operations. Sometimes, if a screen is only partially filled with information, only that information is shown. Other times, information at the top of the screen and the message at the bottom of screen is shown with the ... mark being used to represent the blank screen space in between.

The tutorial screens are intended to be self explanatory but this report gives annotated comments below screens or at the bottom of the page (the nonshaded part of the text). In addition, comments may appear in the screens themselves in *italics*. The screens shown are intended to guide the user when the tutorial is run on the computer.

When the tutorial program is run, many screens simply flash by and the user need not pay them particular attention. The SuperCalc 5 logo screen is one



```
SuperCalc (tm)

Version  5.0    MAINT
(Numeric Coprocessor Installed)

Copyright 1989
Computer Associates International, Inc.

Revision D

Software superior by design.
```

of the ones that will flash by. The screens presented in this report typically are ones with pauses which require the user to press the **Enter** key to proceed. They are meant to be read. Screens in double line boxes are tutorial information screens which discuss the particular SWOPSIM operations about to be invoked. Other screens show prompts required in SWOPSIM programs (which are answered by the tutorial program itself). Some screens show spreadsheet contents for a particular SWOPSIM operation. Pay particular attention to the messages that appear at the bottom of such screens.

SWOPTUT Tutorial: Program Overview

```
SWOPSIM TUTORIAL          SWOPSIM TUTORIAL OVERVIEW          Screen 1

     Welcome to the SWOPSIM demonstration tutorial program.  You can
     select part or all of the steps required to build and exercise a
     small demonstration model SMAL.  The screens and text of this
     tutorial are also presented in the ERS report documenting SWOPSIM.

     Pause points in the tutorial, marked by "Strike a key when ready .",
     give you time to read the screens.  At times, SWOPSIM programs will
     ask you to make selections; just press 'Enter' to select the default
     option.  Do not try to modify the default options in this tutorial!
     Note that at a pause point, you can break out of a program by
     entering a Ctrl C.  The tutorial, like all SWOPSIM programs, puts
     all output on the D: drive before it is permanently saved.  Before
     you continue, you should save any files you want to keep on the D:
     drive and then remove them from the D: drive.

     Selection options for the tutorial are presented after SuperCalc 5 is
     configured.  Follow the instruction below, "Strike a key when ready ."

Strike a key when ready . . .
```

By typing SWOPTUT, the first screen of the tutorial program gives an overview of what to do. The tutorial can be run by moving from one screen to the next or one answer to the next by simply pressing the "Enter" key.

```
SWOPSIM TUTORIAL     Automatic configuration of SuperCalc 5        Set SC5

     In order for SWOPSIM programs, including this tutorial, to run without
     difficulty, SuperCalc defaults will now be set by the tutorial program.

     Default settings will include:

          1.  D:\ becomes the file output directory
          2.  Global NEXT is turned off
          3.  Global evaluation is turned to MANUAL
          4.  Output file settings include 66 lines per page, 132 characters
              per line, no borders on output print files, and various other
              options which are largely the factory set ones.
          5.  User defined format options are reset to factory defined ones.

     This configuration is done by the execution of a macro SETSC5.XQT which
     resides on the SWOPSIM subdirectory.   FIXFORM.BAT does a similar
     configuration with a specified SuperCalc 5 spreadsheet.

CALL SC C:\SWOPSIM\SETSC5
Strike a key when ready . . .
```

The main part of the SWOPTUT tutorial will set ALL of the defaults for SuperCalc 5 to values required for SWOPSIM programs. This is done by invoking a batch program called SETSC5. If the spreadsheet loaded into SuperCalc 5 is not properly configured, many SWOPSIM operations will run into difficulties. Incorrect configuration is one of the main causes of spreadsheet problems for SWOPSIM model builders.

SWOPTUT Tutorial: Program Menu

```
SWOPSIM TUTORIAL     SWOPSIM TUTORIAL MENU - Type SWOPTUT A,     Screen 2
                     SWOPTUT B, etc. (type SWOPTUT ALL for A-I)

   A  -  Design a model by preparing a master model file

   B  -  Create country model spreadsheets

   C  -  Create country base data spreadsheets and enter base data

   D  -  Create country support spreadsheets

   E  -  Enter/change support data - update country support spreadsheets

   F  -  Enter/change elasticities - update country model spreadsheets

   G  -  Initialize country model spreadsheets

   H  -  Create world model from initialized country model spreadsheets

   I  -  Simulate world model and observe results

Strike a key when ready . . .
```

The main SWOPTUT Tutorial menu is the last screen to appear when SWOPTUT is typed. It gives the options for proceeding. Type SWOPTUT ALL if the entire tutorial is to be run. Otherwise select the letter for the part of the tutorial to be run. Note that the first time the tutorial is run on a computer, the option ALL must be selected. As the tutorial proceeds, additional files for the model SMAL are created. When the tutorial is completed, all files for SMAL will exist and subsequently, any part of the tutorial can be repeated independently. An alternative way to proceed is to copy the files for SMAL on the installation disk (SMALSWOP.EXE) onto C:\SMAL, log on to C:\SMAL, type SMALSWOP, and when the files have unpacked, erase SMALSWOP.EXE.

The tutorial SWOPARM is almost identical to SWOPTUT except that it builds and exercises a little Armington bilateral trade flow model LARM which will reside on C:\LARM. After the screens have been presented for SWOPTUT, selected screens for SWOPARM will be presented where they differ significantly.

The equations and specification of the model SMAL created by SWOPTUT are the ones discussed earlier in this report. The user can examine the SMAL spreadsheets at their pleasure after they have been created by the tutorial. The SWOPSIM installation disk also contains a larger demonstration model DEMO which is a real world model that can be used to answer questions and be copied and customized by any user for his own purposes.

```
SWOPSIM TUTORIAL   A  -  Design a model by preparing a master      Screen A1
                         model file SMAL.CAL

    The first step is to pick a 4 digit name for the model.  The tutorial
    selects SMAL for SMAL demonstration model.  Next a subdirectory is
    created named C:\SMAL using the MKDIR command.  Then the tutorial
    runs the command DIR C:\SMAL to show you the empty subdirectory.
```

```
MKDIR C:\SMAL
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL                    This shows the new empty directory
                                          C:\SMAL that has been created.
 .           ..
       2 File(s)   1519616 bytes free
 Strike a key when ready . . .
```

First a directory C:\SMAL is prepared, then a master model file is created, and finally, an ASCII (.PRN) copy of part of the master file is made.

```
SWOPSIM TUTORIAL   A  -  Design a model by preparing a master      Screen A2
                         model file SMAL.CAL

    The next step is to create the master model file for SMAL and the
    derived file SMAL.PRN which serves as a key to subsequent SWOPSIM
    operations.  Normally, you would create SMAL.CAL manually, but now the
    tutorial will create it for you and save it on the C:\SMAL sub-
    directory where it will be used for subsequent SWOPSIM operations for
    the model SMAL (the program MAKEMAS could also be used to create SMAL).

    Design of SMAL:  The model SMAL will have two regions designated by
    by the 2 digit codes US and RW, representing the United States and the
    Rest of the World.  It will have 6 products represented by the 2 digit
    product codes MT (MeaT), DM (Dairy Milk - non traded), DP (Dairy
    Products - traded), CG (Coarse Grains - a feed input to the production
    of MT and DM), OS (OilSeeds), and OM (OilMeals - another feed input).
    DP and OM are produced from DM and OS, respectively.

    As the tutorial creates SMAL.CAL, observe the messages and information
    at the bottom of the screen.  Follow the prompts given by SuperCalc . .
```

```
Strike a key when ready . . .

    |  A  ||  B  ||  C  ||  D  ||  E  ||  F  ||  G  ||  H  |
...
20
Data/information will be entered for the master model file SMAL.CAL.
Necessary (yellow) cells will be protected, other cells will contain
documentation.
READY SWOPSIM Tutorial for SMAL          Enter to continue          CAPS
```

```
    |A||B||C||D||E||F||G||H|                                          | AP|| AQ|| AR |
1   SMAL     Master model file for SMAL                                    1989
2
3        US RW  -  -  -  -   Country Codes (B3:C3)                          WDPRIC
4                            US - United States
5    MT  D  D IU  .  .  .    RW - Rest of World                          MT  2050
6    DM  D  D IB IN NT  .                                                DM   272
7    DP  D  D IU OU  .  .    Matrix Codes (B5:C10)                       DP  2848
8    CG  1  1  I  .  .  .    1 - Supply, demand equations created        CG   108
9    OS  1  1  I IN  .  .    D - same as 1 but supply quantity can       OS   453
10   OM  D  D IB OU  .  .        be included in any demand equation      OM   227
11    ^  .  .  .  .  .  .    . - no equation
12                                                    Product Codes (D5:F10)
13  Product Codes (A5:A10)                              IU - Input Using
14  MT - MeaT (beef, pork, mutton, poultry)             I  - Input
15  DM - Dairy Milk (fluid non traded milk)             IB - I and iu Both
16  DP - traded Dairy Products (butter, cheese, powder) IN - INput, int. dem
17  CG - Coarse Grains (corn, other)                    OU - OUtput, int. de
18  OS - OilSeeds (soybeans, other including rapeseed)  NT - Non-Traded
19  OM - OilMeals (soymeal, other meals)
20
A RANGE must be created when SMAL.PRN is created later by MAKEPRN.
A1:G11 MUST be the range for SMAL with codes for all products/countries.

READY SWOPSIM Tutorial for SMAL.          Enter to continue       CAPS
```

The above screen shows the full information in the master model file for SMAL. Note that there is key information in the matrix telling where equations exist for products and countries and what base world prices to use. Other parts of the master model file contain useful documentation.

```
    |A||B||C||D||E||F||G||H|                                          | AP|| AQ|| AR |
1   SMAL     Master model file for SMAL                                    1989
...
     20
     World prices for the base year for SWOPSIM products MUST be in column AR.
     Cells B5:C10 contain codes if equations exist for products/countries.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
SWOPSIM TUTORIAL   A  -  Design a model by preparing a master      Screen A3
                         model file SMAL.CAL

     All SWOPSIM operations result in the output file on the D: drive.  This
     output must be copied to the model subdirectory for permanent keeping.
     The tutorial now copies SMAL.CAL which has been created from D: to
     C:\SMAL to save it permanently for subsequent SWOPSIM operations.

COPY D:SMAL.CAL C:\SMAL
        1 File(s) copied
Strike a key when ready . . .
```

All SWOPSIM operations result in files being output temporarily on the D: drive. Files must be copied to the C: model subdirectory for safekeeping.

SWOPSIM TUTORIAL | A - Design a model by preparing a master model file SMAL.CAL | Screen A4

The final step is to create an ASCII SMAL.PRN file on C:\SMAL. The tutorial does this by invoking the SWOPSIM program MAKEPRN. SMAL.PRN should look as follows: (A good check is to make sure that the first letter of the product code - M in MT - in the first column - US - is in position row 7 and column 7. A text editor can be used for this check.

Since the tutorial program is infallible, such a check is not necessary for SMAL.PRN. The tutorial will type out the actual file SMAL.PRN for you.

```
12345678..... <--COLUMNS          ROWS
                                   Row 1
                                   Row 2
     SMAL    Master model          Row 3
                                   Row 4
         US RW  -  -  -  -         Row 5
                                   Row 6
       MT  D  D IU  .  .  .        Row 7
       DM  D  D IB IN NT  .        Row 8
       DP  D  D IU OU  .  .           .
       CG  1  1  I  .  .  .
       OS  1  1  I IN  .  .
       OM  D  D IB OU  .  .
        ^  .  .  .  .  .  .
```

Strike a key when ready . . .

SWOPSIM TUTORIAL | A - Design a model by preparing a master model file SMAL.CAL | Screen A5

In order to prepare a PRN file from a master model file, a SWOPSIM program MAKEPRN is used. The tutor will initiate it for you.

```
MAKEPRN SMAL
Strike a key when ready . . .
```

SWOPSIM TUTORIAL | A - Design a model by preparing a master model file SMAL.CAL | Screen A6

Now SMAL.PRN is copied from D: to the C:\SMAL subdirectory for safe-keeping. SMAL.PRN is used as an input to most subsequent operations.

```
COPY D:SMAL.PRN C:\SMAL
       1 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.          ..                   SMAL     CAL    SMAL     PRN
       4 File(s)   1513472 bytes free
Strike a key when ready . . .
```

Now the DOS DIR command shows that SMAL.CAL and SMAL.PRN are on C:\SMAL.

```
SWOPSIM TUTORIAL   A - Design a model by preparing a master model file SMAL.CAL   Screen A7

   Now you have completed SMAL.CAL and SMAL.PRN.  The tutorial program
   concludes this step by typing SMAL.PRN from C:\SMAL for your viewing
   pleasure.

TYPE C:\SMAL\SMAL.PRN

   SMAL       Master model

        US RW  -  -  -  -

    MT  D  D IU  .  .  .
    DM  D  D IB IN NT  .
    DP  D  D IU OU  .  .
    CG  1  1  I  .  .  .
    OS  1  1  I IN  .  .
    OM  D  D IB OU  .  .
      ^  .  .  .  .  .  .
Strike a key when ready . . .
```

This is what the PRN file SMAL.PRN of the master model file SMAL.CAL looks like.

SWOPTUT Tutorial: B - Create Country Model Spreadsheets

```
SWOPSIM TUTORIAL   B - Create country model spreadsheets   Screen B1

                                  .....b.....        s          t
   Each country in a model
   must have 3 spreadsheets    | Country model |  | Country  |  | Country   |
   of information.  A listing  | spreadsheet   |  | support  |  | base data |
   of the names of the SMAL    |               |  | spreadsheet |  | spreadsheet |
   model required spreadsheets
   is shown here for -------->  ...SMALbUS...     SMALsUS       SMALtUS
   country/region US, RW. --->  ....SMALbRW...    SMALsRW       SMALtRW

   The first major SWOPSIM model building task is to create the country
   model spreadsheets.  Note that ALL SWOPSIM models must have RW (Rest-
   of-World) as the final region to close the world.  The SWOPSIM program
   CREATE will create the required country model spreadsheets for all
   countries in a model on the D: drive.  They then must be saved manually
   to C:\SMAL in this case (the tutorial will do it for you).  In
   addition, a file SMALLOOP.BAT is created which must be saved to the
   C:\BATCH subdirectory.  This is a looping program which can be used to
   perform subsequent SWOPSIM operations for all countries in one command.

Strike a key when ready . . .
```

After the master model file and its ASCII PRN file are safely ensconced on the model subdirectory, the next step is to create country model spreadsheets from the information in the master model file. This step will result in empty country model spreadsheets stored on C:\SMAL by the SWOPTUT tutorial program. The program CREATE is run which also creates a LOOP batch program which must

be saved on the batch subdirectory. This file loops through all countries when calling the program the user types after the word create.

```
SWOPSIM TUTORIAL     B - Create country model spreadsheets          Screen B2

                                  .....b.....        s                 t
    Each country in a model
    must have 3 spreadsheets      Country            Country           Country
    of information. A listing     model              support           base data
    of the names of the SMAL      spreadsheet        spreadsheet       spreadsheet
    model required spreadsheets
    is shown here for -------->   ...SMALbUS...      SMALsUS           SMALtUS
    country/region US, RW. --->   ...SMALbRW...      SMALsRW           SMALtRW

    The CREATE program invoked below will create SMALbUS and SMALbRW.
    Later in step F, elasticities and other data will be added to these
    spreadsheets. When SuperCalc asks about the symmetry option, select
    the default (Yes) by pressing Enter.

CREATE SMAL
Strike a key when ready . . .

Program to create new blank country/region spreadsheets from master
file (spreadsheet). The new spreadsheets will be empty -
elasticities and base data must be added to the new spreadsheets in
order to create constants and equations with the 'EQUATION'
program. Master '.CAL' AND '.PRN' files must be on a subdirectory.

Be sure to answer all questions with CAPITAL LETTERS!


Reading master file - C:\SMAL.PRN

                                  This is an example of a prompt screen from
Countries/regions are:            a SWOPSIM program (in this case CREATE).

US RW

Product groups are:

MT DM DP CG OS OM

Do you want symmetry formulas in matrices [Y (default) or N]?
.... New page of screen
Writing 'XQT' macro program to create model spreadsheets .....

    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1
...
    19          Most SWOPSIM operations show you only a blank screen with a
    20          message on the bottom (shown below). This speeds programs.
    Creating country model spreadsheet:  SMALbUS
    Width:  9  Memory: 2702  Last Col/Row:A1

    READY Vernon Oley Roningen, Nielsville, Minn. 56568   MACRO      CAPS
```

SWOPSIM TUTORIAL | B - Create country model spreadsheets | Screen B3

Now the country spreadsheets are on the D: drive as shown below. After taking a quick look at SMALbUS to observe where elasticities and data will eventually be entered, the tutorial will save the files on C:\SMAL. Note that errors you will see in SMALbUS are generated by symmetry formulas which try to divide by zero. These errors will disappear when data is entered into the spreadsheets.

```
DIR D:/W

 Volume in drive D is VDISK  V3.3
 Directory of  D:\

SMALBUS  CAL    LOAD     BAT    SMALBRW  CAL    SMALLOOP BAT
       5 File(s)   3841024 bytes free
Strike a key when ready . . .
```

	A	B	C	D	E	F	G	H
1	SMALbUS	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM
4	MT	.00	.00	.00	.00	.00	.00	.00
5	DM	ERROR	.00	.00	.00	.00	.00	ERROR
6	DP	ERROR	ERROR	.00	.00	.00	.00	ERROR
7	CG	ERROR	ERROR	ERROR	.00	.00	.00	ERROR
8	OS	ERROR	ERROR	ERROR	ERROR	.00	.00	ERROR
9	OM	ERROR	ERROR	ERROR	ERROR	ERROR	.00	ERROR
10								
11	DEMAND-EL	MT	DM	DP	CG	OS	OM	SMT
12	MT	.00	.00	.00	.00	.00	.00	
13	DM	ERROR	.00	.00	.00	.00	.00	
14	DP	ERROR	ERROR	.00	.00	.00	.00	
15	CG	ERROR	ERROR	ERROR	.00	.00	.00	
16	OS	ERROR	ERROR	ERROR	ERROR	.00	.00	
17	OM	ERROR	ERROR	ERROR	ERROR	ERROR	.00	
18								
19								
20	SMALbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND

Cells that can contain elasticities and/or data are outlined in GRAY (Shadow).
Later, elasticities and data will be entered.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
...								
20	SMALbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND
21	MT	2050	0	0	0	1	0	0
22	DM	272	0	0	0	1	0	0
23	DP	2848	0	0	0	1	0	0
24	CG	108	0	0	0	1	0	0
25	OS	453	0	0	0	1	0	0
26	OM	227	0	0	0	1	0	0

SWOPSIM TUTORIAL B - Create country model spreadsheets Screen B4

Now the country spreadsheets on D: will be saved to C:\SMAL. Then the contents of C:\SMAL are viewed with the DOS DIR command.

```
COPY D:SMALb??.CAL C:\SMAL
D:SMALBUS.CAL
D:SMALBRW.CAL
        2 File(s) copied
COPY D:SMALLOOP.BAT C:\BATCH
        1 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.              ..             SMAL     CAL    SMAL     PRN    SMALBUS  CAL
SMALBRW  CAL
        6 File(s)   1488896 bytes free
Strike a key when ready . . .
```

Now the directory C:\SMAL contains the master model file and the blank created country spreadsheets SMALbUS.CAL and SMALbRW.CAL. Step B of the SWOPTUT tutorial program is complete.

SWOPTUT Tutorial: C - Create Country Base Data Spreadsheets and Enter Base Data

SWOPSIM TUTORIAL C - Create country base data spreadsheets and enter base data Screen C1

b s .....t.....

Each country in a model must have 3 spreadsheets of information. A listing of the names of the SMAL model required spreadsheets is shown here for country/region US, RW.

	Country model spreadsheet	Country support spreadsheet	Country base data spreadsheet
--------->	SMALbUS	SMALsUS	...SMALtUS...
--->	SMALbRW	SMALsRW	...SMALtRW...

The second major SWOPSIM model building task is to create the country base data spreadsheets. This is done by entering base data into a blank spreadsheet in the correct format. The tutorial program will do this for you and save the spreadsheets SMALtUS.CAL and SMALtRW.CAL on C:\SMAL.

Balanced global data is the core of a SWOPSIM modeling effort. Net trade MUST be globally balanced for each product in the model SMAL when the model is initialized. A check for this balance is shown.

Strike a key when ready . . .

The next major step is to prepare the "t" base data spreadsheets, the repository for production, consumption, and trade data for a model.

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1
...
   20
   Base data will now be entered into an empty spreadsheet which then will
   be saved as SMALtUS.CAL on C:\SMAL.

  READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1     SMALtUS  Imports  Exports  E-M-S-D    Prod.    Cons.
2       1989   BGRIMP   BGREXP   NTRADE    SUPPLY   DEMAND   000 MT
3       MT        1421      1032      -389    27972    28361          MT - MeaT
4       DM           0         0         0    65432    65432          DM - Dair
5       DP         128       220        92     3498     3406          DP - trad
6       CG        1411     68901     67490   221443   153953          CG - Coar
7       OS         449     17481     17032    59339    42307          OS - OilS
8       OM         381      4535      4154    26760    22606          OM - OilM
9
...
20
Note that in each base data spreadsheet, certain data definitions hold.
In particular, SUPPLY - DEMAND = NTRADE = BGREXP - BGRIMP.

READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1
...
   20
   Base data will now be entered into an empty spreadsheet which then will
   be saved as SMALtRW.CAL on C:\SMAL.

  READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1     SMALtRW  Imports  Exports  E-M-S-D    Prod.    Cons.
2       1989   BGRIMP   BGREXP   NTRADE    SUPPLY   DEMAND   000 MT
3       MT        6369      6758       389   122104   121715          MT - MeaT
4       DM           0         0         0   374817   374817          DM - Dair
5       DP        1289      1197       -92    17738    17830          DP - trad
6       CG       98317     30827    -67490   578790   646280          CG - Coar
7       OS       30732     13700    -17032   152074   169106          OS - OilS
8       OM       33844     29690     -4154    90063    94217          OM - OilM
9
...
20
Note that in each base data spreadsheet, certain data definitions hold.
In particular, SUPPLY - DEMAND = NTRADE = BGREXP - BGRIMP.

READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

In contrast to the country model spreadsheets (b) and the country support spreadsheets (s), the base data spreadsheet (t) must be created manually; there is no creation program for it. The format for the base data spreadsheet is always as shown above. Programs move this data to other spreadsheets.

SWOPSIM TUTORIAL C - Create country base data spreadsheets and enter base data Screen C2

The files SMALtUS.CAL and SMALtRW.CAL that have been created on D: now have to be copied to C:\SMAL for safekeeping.

```
COPY D:SMALt??.CAL C:\SMAL
D:SMALTUS.CAL
D:SMALTRW.CAL
        2 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.                       ..                      SMAL     CAL    SMAL     PRN    SMALBUS  CAL
SMALBRW  CAL    SMALTUS  CAL    SMALTRW  CAL
        8 File(s)   1480704 bytes free
Strike a key when ready . . .
```

SWOPSIM TUTORIAL C - Create country base data spreadsheets and enter base data Screen C3

Each country in a model must have 3 spreadsheets of information. A listing of the names of the SMAL model required spreadsheets is shown here for country/region US, RW.

	b Country model spreadsheet	s Country support spreadsheet	.....t..... Country base data spreadsheet
--------->	SMALbUS	SMALsUS	...SMALtUS...
--->	SMALbRW	SMALsRW	...SMALtRW...

A key to the successful construction of a SWOPSIM global model is to initialize country model spreadsheets with base data that is globally balanced. This means that the base data spreadsheets must be globally balanced. Data in the RW base data spreadsheet is usually adjusted to reach a global balance where net trade for each product sums to zero across all countries in a model. The program TABLE can be used to check this balance, or as this tutorial does, a manual check can be made with a spreadsheet. If global net trade is not balanced for a product, RW base supply or demand data are adjusted accordingly.

Strike a key when ready . . .

Now, a check is performed on the global balance for each product.

	A	B	C	D	E	F	G	H
1								
...								
20								

Now net trade from SMALtUS.CAL and SMALtRW.CAL will be summed for each product to see if the global sums are zero.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
1	SMALtUS	Imports	Exports	E-M-S-D	Prod.	Cons.	NTRADE =	
2	1989	BGRIMP	BGREXP	NTRADE	SUPPLY	DEMAND	SUP-DEM	
3	MT	1421	1032	-389	27972	28361	-389	
4	DM	0	0	0	65432	65432	0	
5	DP	128	220	92	3498	3406	92	
6	CG	1411	68901	67490	221443	153953	67490	
7	OS	449	17481	17032	59339	42307	17032	
8	OM	381	4535	4154	26760	22606	4154	
9								
10	SMALtRW	Imports	Exports	E-M-S-D	Prod.	Cons.	NTRADE =	SUM OF US+RW
11	1989	BGRIMP	BGREXP	NTRADE	SUPPLY	DEMAND	SUP-DEM	NTRADE
12	MT	6369	6758	389	122104	121715	389	0
13	DM	0	0	0	374817	374817	0	0
14	DP	1289	1197	-92	17738	17830	-92	0
15	CG	98317	30827	-67490	578790	646280	-67490	0
16	OS	30732	13700	-17032	152074	169106	-17032	0
17	OM	33844	29690	-4154	90063	94217	-4154	0
18								
19								
20								

Net trade from SMALtUS.CAL and SMALtRW.CAL has been summed
for each product and it does sum to zero. Base data IS balanced globally!

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

This spreadsheet check shows that for each product globally, net trade = supply - demand = 0. A check such as this must always be made to prevent the world model from being out of balance when it is created. The program TABLE can also be used to make this check on the country model spreadsheets.

SWOPSIM TUTORIAL — D - Create country support spreadsheets — Screen D1

Each country in a model must have 3 spreadsheets of information. A listing of the names of the SMAL model required spreadsheets is shown here for country/region US, RW.

	b	.....s.....	t
	Country model spreadsheet	Country support spreadsheet	Country base data spreadsheet
--------->	SMALbUS	...SMALsUS...	SMALtUS
--->	SMALbRW	...SMALsRW...	SMALtRW

The third major SWOPSIM model building task is to create the country support spreadsheets. The first step is to invoke the SWOPSIM program CREATEWK which creates the support spreadsheet template SMALWORK.CAL on D:. When SMALWORK is saved on C:\SMAL and country support spreadsheets exist on C:\SMAL, the program WORK can update support for each country. However, for the first update, SMALsUS.CAL and SMALsRW.CAL must be put on C:\SMAL by copying SMALWORK.CAL to each of these names.

CREATEWK SMAL
Strike a key when ready . . .

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1   SMALWORK   Policy Support Worksheet              Exchange Rate (Local Curren
2            Base Year ----->                                 Local Currency Uni
3    11/23/87  -----------Model Base Data-------- Producer  --Base Gross tra
4              (US$/MT)   ----1000 MT----   S.-D.= Share C.  EXPorts  IMPorts
5      REGION  WDPRICE   SUPPLY   DEMAND   NTRADE  PRSHARE    BGEXP    BGIMP
6                        This is the screen seen when the SWOPSIM program
7          ..            CREATEWK is running.  The screen is largely blank
8          ..            but the message at the bottom tells what the program
9          ..            is doing.  Screen activity is blanked out during
10         ..            SWOPSIM operations to speed up SWOPSIM programs.
11         ..
12         ..            You will see that part of the spreadsheet which
13                       is called up at the beginning of the program.
14                       Here you see rows 3:5 and 19:20 but you do not see
15                       formulas filled in elsewhere by the program
16                       CREATEWK.
17
18
19                -------Model Price Wedges------ (A=Aggr.      -------Model
20                ---------- U.S.$/MT ----------  PROBlem     Percent of Do
Creating template for support worksheet:  SMALWORK
Width:  9  Memory: 2702  Last Col/Row:A1
```

```
SWOPSIM TUTORIAL    D  -  Create country support spreadsheets    Screen D2

    Now the template SMALWORK.CAL will be copied to C:\SMAL.  In
    addition, SMALWORK.CAL is copied to C:\SMAL as SMALsUS.CAL and
    SMALsRW.CAL.  This enables WORK to update "empty" support files in
    the next step.  Also, a small macro, SMALTHIN.XQT, created by CREATEWK
    is saved on C:\SMAL.


COPY D:SMALWORK.CAL C:\SMAL
COPY D:SMALWORK.CAL C:\SMAL\SMALsUS.CAL
COPY D:SMALWORK.CAL C:\SMAL\SMALsRW.CAL
COPY D:SMALTHIN.XQT C:\SMAL
        1 File(s) copied
        1 File(s) copied
        1 File(s) copied
        1 File(s) copied
Strike a key when ready . . .
```

The country support spreadsheets are created by the program WORK from a template created by the program CREATEWK. WORK is an "updating" program which takes the old spreadsheets containing numbers, adds formulas, and updates the numbers. This same process is used for the creation of the country support spreadsheets; but, we need an original sheet to update. This is done putting a named copy of the template created by CREATEWK on C:\SMAL for each country.

The updating programs such as WORK must be run for each country in the model at this stage. This is where the batch looping program comes in handy. By executing it (by typing SMALLOOP WORK in this case), one command can loop through operations for all countries in the model.

SWOPSIM TUTORIAL | D - Create country support spreadsheets | Screen D3

Each country in a model must have 3 spreadsheets of information. A listing of the names of the SMAL model required spreadsheets is shown here for --------> country/region US, RW. --->

b	.....s.....	t
Country model spreadsheet	Country support spreadsheet	Country base data spreadsheet
SMALbUS	...SMALsUS...	SMALtUS
SMALbRW	...SMALsRW...	SMALtRW

The program WORK will be used to update the files SMALbUS.CAL and SMALbRW.CAL. Since support data is not yet added to these files, they will be created with zero support (giving price wedges of zero). The support spreadsheets have evolved over time and contain many side calculations that serve as checks on support, calculations of PSE's, and TDS measures. Some supplemental information is drawn from a file SMALADD.CAL which contains user customized information for some of these extra calculations.

Strike a key when ready . . .

SWOPSIM TUTORIAL | D - Create country support spreadsheets | Screen D4

Before WORK is run, the tutorial program will create a supplementary support file SMALADD.CAL and its calling macro SMALADD.XQT and save them on C:\SMAL. SMALADD.CAL allows the user to add customized calculations to support spreadsheets for a model.

Strike a key when ready . . .

	A	B	C	D	E	F	G	H
1	SMALADD							
2								
...								
20								

SMALADD.CAL, a customized addition to SMALWORK.CAL, will be created.
Explanations will be added as the spreadsheet is created.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

Here is an example of a SWOPSIM program requiring an additional spreadsheet which is added to another one. This allows easier customization of a standard spreadsheet because additions can be made to this extra spreadsheet; the SMALWORK.CAL will be totally re-created every time CREATEWK is run but SMALADD.CAL is created manually. A point to remember about the country support spreadsheets is that they have evolved over a few years to serve many purposes, some of which are not as relevant today as in the past. For example, they contain many "cross-checks" of PSE information which may not be needed by more experienced analysts.

```
    |   BP   ||    BQ    ||    BR    ||   BS   ||   BT   ||   BU   ||   BV   ||   BW   |
1                PFACTOR   QFACTOR
2               *USPUNIT  *USQUNIT
3                =US$/MT  =1000 MT
4
5                PFACTOR   QFACTOR
6
7                   33.3      33.3
8                 22.0462  .4535929
9                 22.0462  .4535929
10                39.3679   25.4014
11
...
20
```

Conversion factors have been added to allow support information to be calculated in US S&O units from metric units used in SMAL.

```
READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   CZ   ||    DA    ||    DB    ||   DC   ||   DD   ||   DE   ||   DF   ||   DG   |
1
...
6
7                    .80       -.80
8
9                    .40       -.48
10                   .55       -.80
11                   .60       -.70
12                   .25       -.70
13
...
20
```

Average elasticities are being added for TDS (Trade Distorted by Support) calculations.

```
READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   A    ||    B    ||    C    ||    D    ||    E    ||    F    ||    G    ||    H    |
1   SMALADD
2
...
6
7                *These numbers are producer prices as*      .53
8                *shares of consumer prices. --->*           .50
9                                                            .75
10                                                           .90
11                                                           .93
12                                                           .80
...
20
```

SMALADD.CAL will be saved to D:. If SMALADD.CAL is modified later, changes are carried into support spreadsheets every time WORK is run.

```
READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

Next, SMALLOOP loops through WORK for the US and RW in the model SMAL.

SWOPSIM TUTORIAL — D - Create country support spreadsheets — Screen D5

The program WORK, like many SWOPSIM programs, must be run for each country in a model. However, by using a looping batch program that was created earlier, WORK can be run for all countries in a model with one command. The looping program created earlier for SMAL is SMALLOOP.BAT.

```
SMALLOOP WORK
Strike a key when ready . . .

    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1   SMALsUS
2
...
20
Updating support spreadsheet: SMALsUS
Width:  9  Memory: 2700  Last Col/Row:A1

READY                                                              CAPS
```

A similar screen would be seen for the country support spreadsheet SMALsRW.

SWOPSIM TUTORIAL — D - Create country support spreadsheets — Screen D6

The final step is to save the newly created support files on D: to the C:\SMAL subdirectory. Then, the directory of C:\SMAL is shown.

```
COPY D:SMALs??.CAL C:\SMAL
D:SMALSUS.CAL
D:SMALSRW.CAL
        2 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.               ..              SMAL     CAL     SMAL     PRN     SMALBUS  CAL
SMALBRW  CAL    SMALTUS  CAL    SMALTRW  CAL     SMALTHIN XQT     SMALWORK CAL
SMALSUS  CAL    SMALSRW  CAL    SMALADD  XQT     SMALADD  CAL
      14 File(s)   1355776 bytes free
Strike a key when ready . . .
```

Now as the above screen shows, the model subdirectory (C:\SMAL) contains the support spreadsheets for US and RW. At the end of each step, the tutorial uses the DOS DIR command to show how the model files are built up sequentially with each step.

The next two steps in the tutorial enter data in files created by the steps shown above. They involve programs which update files after data have been entered or changed. The reasons for updating processes are ones of efficiency. Files containing data and derived calculations take less disk space if kept in value form. Update programs recalculate derived values.

SWOPSIM TUTORIAL | E - Enter/change support data - update country support spreadsheets | Screen E1

Once a country support spreadsheet has been saved on C:\SMAL, the SWOPSIM program WORK can be run to update the spreadsheet. The updated spreadsheet will be on D: and can be manually copied to C:\SMAL for permanent residence. Whenever support data is changed on any support spreadsheet, this update process can be repeated.

The tutorial program will first enter support data into SMALsUS.cal and SMALsRW.CAL. Then SMALLOOP.BAT is used to loop through the WORK program for US and RW to update the support spreadsheets with this new support data. The updated support spreadsheets are then saved on C:\SMAL.

The support spreadsheets are the source for model price wedge and budget expenditure wedge equivalents of support. The support data is sourced directly from line items of PSE, CSE calculations. The support spreadsheet also carries consistency checks and side calculations that help you gauge support levels and their measurement.

Strike a key when ready . . .

	A	B	C	D	E	F	G	H
1								
...								
20								

Now, support data from US PSE calculations will be entered into the support spreadsheet SMALsUS.CAL which has been loaded by SuperCalc.

MENU SWOPSIM Tutorial for SMAL Enter to continue CAPS

	AC	AD	AE	AF	AG	AH	AI	AJ
16								
17		Enter '1'						
18		if non->	----------	----------	----------	Alternative Non Model D		
19		PSE data	Domestic Quant.			------Non Model Prices----		
20		is used	----1000 MT----		-------Local Currency / MT-------			
21	US	OMIT	ASUPPLY	ADEMAND	DIRPAY	APRPRICE	ACNPRICE	ATDPRICE
22								
23	MT	0						
24	DM	0						
25	DP	0	0					
26	CG	0						
27	OS	0						
28	OM	0	0					
...								
35								

First, production and market price data from US PSE calculations are loaded into SMALsUS.CAL. The market price is the key SWOPSIM base price.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

```
    |   AC  ||   AD  ||   AE  ||   AF  ||   AG  ||   AH  ||   AI  ||   AJ  |
16
17                Enter '1'
18                 if non->  ------------------------------Alternative Non Model D
19                 PSE data   Domestic Quant.                    ------Non Model Prices----
20                  is used   ----1000 MT----    --------Local Currency / MT-------
21          US        OMIT  ASUPPLY  ADEMAND   DIRPAY APRPRICE ACNPRICE ATDPRICE
22
23          MT           0    32101 |                          1625
24          DM           0    65432 |                           301
25          DP           0     3498 | Analyst supply data      2938
26          CG           0   206892 |_|                          89
27          OS           0    59339 |                           193
28          OM           0    26760 |                           171
...
35
The analyst supply data is used to pro-rate PSE support data to
SWOPSIM base data which comes from the FAS PS&D database.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   CU  ||   CV  ||   CW  ||   CX  ||   CY  ||   CZ  ||   DA  ||   DB  |
16
17                A-Direct  A-Other A-Direct   Model market support if:
18    A-Market Producer Producer Consumer   Quant.   Export   Import
19     Support  Support  Support  Support   Restr.    Subs.      Tax
20    -----------Local Currency----------   -----Local Currency-----  Total->
21          AMS      ADPS      AOPS      ADCS     MSQR     MSES     MSIT
22
...
35
Next, support data from PSE calculations are loaded into SMALsUS.CAL
as market, direct producer, other producer, and direct consumer support.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   CU  ||   CV  ||   CW  ||   CX  ||   CY  ||   CZ  ||   DA  ||   DB  |
16
17                A-Direct  A-Other A-Direct   Model market support if:
18    A-Market Producer Producer Consumer   Quant.   Export   Import
19     Support  Support  Support  Support   Restr.    Subs.      Tax
20    -----------Local Currency----------   -----Local Currency-----  Total->
21          AMS      ADPS      AOPS      ADCS     MSQR     MSES     MSIT
22
23          613       284      3445       292                              MT
24         5544         0      1570       443                              DM
25         2893         0         0       499                              DP
26            0      5297      2625         7                              CG
27            0        80       758         4                              OS
28            0         0         0         0                              OM
...
35
Market support data is marked by policy type (quota = 1, export
tax = 2, or import tax = 3) in column AB.  The tutorial marks for you.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   Z   ||   AA   ||   AB   ||   AC   ||   AD   ||   AE   ||   AF   ||   AG   |
1                        Support SMALsUS  ----------Consumer Support (subsidi
2                        1=Quota,         --------Commodity Programs----------
3      Market       Net 2=Exp.T.  5/26/91         1         1         1         1
4     Support     Trade 3=Imp.T.                Budg. Budg.&PW O.F.&PW        PW
5        CAMS SCNTRADE   MSTYPE       US     CSCPB  CSCPBPW  CSCPOPW   CSCPPW
6
7                -389         3       MT
8                             1       DM
9                  92         2       DP
10              67490                 CG
11              17032                 OS
12               4154                 OM
13
14                                    SUM
...
20                                          is used   ----1000 MT----   ------
Now, support data has been entered for the US and the file will be saved on
D:.  When it has been copied to C:\SMAL, WORK will be run to recalculate.

    READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   Z   ||   AA   ||   AB   ||   AC   ||   AD   ||   AE   ||   AF   ||   AG   |
21   SETSIDE   SUPTAX PADJFACT       US     OMIT  ASUPPLY  ADEMAND   DIRPAY
22
23                                    MT        0    32101
24                 US coarse grain    DM        0    65432
25                 set-aside %        DP        0     3498
26        .08 <-- (increase in        CG        0   206892
27                 supply if set-     OS        0    59339
28                 aside removed)     OM        0    26760
...
40
Before we leave SMALsUS, the US set-aside shifter must be entered
for CG.  It is the increase in US production when support is removed.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1
...
20
Now, support data from RW PSE aggregations will be entered into the
support spreadsheet SMALsRW.CAL which has been loaded by SuperCalc.

MENU  SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   AC   ||   AD   ||   AE   ||   AF   ||   AG   ||   AH   ||   AI   ||   AJ   |
...
35
First, production and market price data from RW PSE aggregations are
loaded into SMALsRW.CAL. The market price determines SWOPSIM price structure.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

We are now entering support data into SMALsRW.

```
    |   AC  ||   AD  ||   AE  ||   AF  ||   AG  ||   AH  ||   AI  ||   AJ  |
16
17            Enter '1'
18             if non->  ------------------------------Alternative Non Model D
19             PSE data  Domestic Quant.                    ------Non Model Prices----
20              is used  ----1000 MT----   -------Local Currency / MT-------
21          RW     OMIT  ASUPPLY  ADEMAND  DIRPAY APRPRICE ACNPRICE ATDPRICE
22
23          MT        0  108817                        1747
24          DM        0  209556                         311
25          DP        0   11429                        2838
26          CG        0  410757                         133
27          OS        0   84017                         275
28          OM        0   20270                         218
...
35
The analyst supply data is used to pro-rate PSE support data to
SWOPSIM base data which comes from the FAS PS&D database.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   CU  ||   CV  ||   CW  ||   CX  ||   CY  ||   CZ  ||   DA  ||   DB  |
16
...
35
Next, support data from PSE calculations are loaded into SMALsRW.CAL
as market, direct producer, other producer, and direct consumer support.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

```
    |   CU  ||   CV  ||   CW  ||   CX  ||   CY  ||   CZ  ||   DA  ||   DB  |
16
17                A-Direct  A-Other A-Direct   Model market support if:
18    A-Market Producer Producer Consumer   Quant.   Export   Import
19     Support  Support  Support  Support   Restr.     Subs.      Tax
20    ----------Local Currency----------   -----Local Currency-----  Total->
21          AMS      ADPS      AOPS      ADCS     MSQR     MSES     MSIT
22
23        32764      3553      6044      1711                                MT
24        34139      1599      2227      1841                                DM
25        19310       292      1668         0                                DP
26        11396      1702      5994      1121                                CG
27        -1840      2230      2290       771                                OS
28           -1         0         0         0                                OM
29
...
35
Finally, market support data is marked by policy type (quota = 1, export
tax = 2, or import tax = 3) in column AB.  The tutorial marks for you.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

Note that market support must be one of three policies: a trade quota, an import tax or subsidy, or an export tax or subsidy. The support worksheet requires that this be marked in column AB so that the proper price wedges are calculated.

```
    |   Z   ||   AA   ||   AB   ||   AC   ||   AD   ||   AE   ||   AF   ||   AG   |
1                        Support SMALsRW  ----------Consumer Support (subsidi
2                        1=Quota,         --------Commodity Programs----------
3       Market      Net 2=Exp.T.  5/26/91         1         1         1         1
4      Support    Trade 3=Imp.T.                Budg. Budg.&PW  O.F.&PW        PW
5         CAMS SCNTRADE   MSTYPE        RW     CSCPB  CSCPBPW  CSCPOPW   CSCPPW
6
7                   389        2        MT
8                              1        DM
9                   -92        3        DP
10                -67490       3        CG
11                -17032       1        OS
12                 -4154       3        OM
...
20                                              is used   ----1000 MT----   ------
Now, support data has been entered for RW and the file will be save on D:.
When it has been copied to C:\SMAL, WORK will be run to recalculate.

READY SWOPSIM Tutorial for SMAL          Enter to continue      CAPS
```

```
SMALLOOP WORK
Strike a key when ready . . .
```

SWOPSIM TUTORIAL | E - Enter/change support data - update country support spreadsheets | Screen E2

The tutorial program invokes SMALLOOP to run WORK for US and RW. WORK recalculates price and budget wedges, given the latest support data in the support spreadsheets on C:\SMAL.

```
COPY D:SMALs??.CAL C:\SMAL
D:SMALSUS.CAL
D:SMALSRW.CAL
        2 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.               ..              SMAL     CAL     SMAL     PRN     SMALBUS  CAL
SMALBRW  CAL    SMALTUS  CAL    SMALTRW  CAL     SMALTHIN XQT     SMALWORK CAL
SMALSUS  CAL    SMALSRW  CAL    SMALADD  XQT     SMALADD  CAL
       14 File(s)   1345536 bytes free
Strike a key when ready . . .
```

SWOPSIM TUTORIAL | E - Enter/change support data - update country support spreadsheets | Screen E3

Finally, the updated spreadsheets SMALsUS.CAL and SMALsRW.CAL are copied from D: to C:\SMAL for safekeeping. C:\SMAL is then viewed.

Now the completed country support spreadsheets are updated on C:\SMAL.

```
SWOPSIM TUTORIAL    F  -  Enter/change elasticities - update      Screen F1
                          country model spreadsheet

    Elasticities and other data not found in the base data or support
    spreadsheets must be entered manually into the country model spread-
    sheet.  The program SUPPORT will take support data (price and budget
    wedges) and base price and quantity data into the country spreadsheet.
    When all data and elasticities are entered, the country model spread-
    sheets are ready to be initialized with the SWOPSIM program EQUATION.

    First, the tutorial will run the SWOPSIM program SUPPORT to bring
    support and base data into SMALbUS.CAL and SMALbRW.CAL which are saved
    on C:\SMAL.  Then elasticities and other data are entered by the
    tutorial program, again saving the country model files on C:\SMAL.
    A visual check of the elasticities is then made.

SMALLOOP SUPPORT
Strike a key when ready . . .

     |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1
...
20
Reading support data from: SMALsRW
Width:  9  Memory: 2700  Last Col/Row:A1

READY Vernon Oley Roningen, Nielsville, Minn. 56568   MACRO      CAPS
```

```
SWOPSIM TUTORIAL    F  -  Enter/change elasticities - update      Screen F2
                          country model spreadsheet

    The country model spreadsheets SMALbUS.CAL and SMALbRW.CAL which have
    new support data in them now will be copied to C:\SMAL for safekeeping.
    Then the tutorial program will enter elasticities and some other data
    into the country model spreadsheets and re-save them on C:\SMAL.

COPY D:SMALb??.CAL C:\SMAL
Strike a key when ready . . .
```

Information such as elasticities must be entered manually into the country model spreadsheets. Since the symmetry option was selected in the tutorial program, the program will enter elasticities only in the top right half of the supply and demand elasticity matrices. The next screen shows SMALbUS.CAL without the elasticities and the following one shows them with the elasticities entered by the tutorial program. The symmetry formulas have not been invoked by calculating the spreadsheet yet, hence the lower right half of the matrices still are shown to have zeros. As a practical matter, when elasticities are entered, it is wise to calculate the spreadsheet to see if the symmetry formulas yield unusual numbers. Entered elasticities may, for example, have to be revised because of undesirable symmetry effects.

	A	B	C	D	E	F	G	H
1	SMALbUS	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM
4	MT	.00	.00	.00	.00	.00	.00	.00
5	DM	.00	.00	.00	.00	.00	.00	.00
6	DP	.00	.00	.00	.00	.00	.00	.00
7	CG	.00	.00	.00	.00	.00	.00	.00
8	OS	.00	.00	.00	.00	.00	.00	.00
9	OM	.00	.00	.00	.00	.00	.00	.00

...

Income and population growth rates, income and population, and the upper right half of the supply elasticity matrix are entered into SMALbUS.CAL.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
1	SMALbUS	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM
4	MT	.70	.01		-.11		-.03	.00
5	DM	.00	.50		-.04		-.01	.00
6	DP	.00	-.15	.43				.00
7	CG	.00	.00	.00	.55	-.08		.00
8	OS	.00	.00	.00	.00	.59		.00
9	OM	.00	.00	.00	.00	-.15	.20	.00

...

Final demand shares and elasticities, feed shares for meat/milk production and upper right half of demand elasticity matrix go into SMALbUS.CAL.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	AG	AH	AI	AJ	AK	AL	AM
17		OM						

...

20	SMALbUS	SUPGROW	INCELAS	PTELAS	DPSW	GSW	MSW	ESW
21	MT				9	9	-19	0
22	DM				85	-78	0	0
23	DP				0	147	0	827
24	CG				26	0	0	0
25	OS				1	0	0	0
26	OM				0	0	0	0

...

Supply growth rates and income elasticities are entered into the product rows of the model country spreadsheet SMALbUS.CAL.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
1								

...

20

The country model spreadsheet SMALbUS.cal is now being saved on the D: drive. It will then be copied to C:\SMAL.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
1	SMALbRW	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS

...

Income and population growth rates, income and population, and the upper right half of the supply elasticity matrix are entered into SMALbRW.CAL.

	A	B	C	D	E	F	G	H
1	SMALbRW	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM
4	MT	.55	.02		-.05		-.02	.00
5	DM	.00	.42		-.02		-.01	.00
6	DP	.00	-.12	.32				.00
7	CG	.00	.00	.00	.43	-.02		.00
8	OS	.00	.00	.00	.00	.38		.00
9	OM	.00	.00	.00	.00	-.05	.10	.00

...

Final demand shares and elasticities, feed shares going to meat/milk production and upper right half of demand elasticity matrix go into SMALbRW.CAL.

	A	AG	AH	AI	AJ	AK	AL	AM

...

Supply growth rates and income elasticities are entered into the product rows of the model country spreadsheet SMALbRW.CAL.

	A	B	C	D	E	F	G	H
1	SMALbRW	1989	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	DP	CG	OS	OM	SUPSUM
4	MT	.55	.02		-.05		-.02	.50
5	DM	.04	.42		-.02		-.01	.43
6	DP		-.12	.32				.20
7	CG				.43	-.02		.41
8	OS				-.03	.38		.35
9	OM					-.05	.10	.05

...

The country model spreadsheet SMALbRW.cal is now being saved on the D: drive. It will then be copied to C:\SMAL.

SWOPSIM TUTORIAL	F - Enter/change elasticities - update country model spreadsheet	Screen F3

After all data have been entered into the country model spreadsheets and before they are initialized with EQUATION, it is good to visually check the elasticities. The tutorial program will do this for the country model spreadsheet SMALbUS.CAL.

```
COPY C:\SMAL\SMALbUS.CAL D:
        1 File(s) copied
Strike a key when ready . . .
```

The final data step shown by the tutorial is a visual check of the elasticities. This is extremely important to avoid problems in later steps.

```
    |  A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1     SMALbUS      1989  XRATE-(LC/US$)->         1  5/26/91          TRANSMISS
2
3   SUPPLY-EL        MT        DM        DP        CG        OS        OM   SUPSUM
4           MT       .70       .01                -.11                -.03      .57
5           DM       .02       .50                -.04                -.01      .47
6           DP                -.15       .43                                     .28
7           CG                                     .55      -.08                .47
8           OS                                    -.18       .59                .41
9           OM                                              -.15       .20      .05
10
11  DEMAND-EL        MT        DM        DP        CG        OS        OM       SMT
12          MT     -.65
13          DM       .00      -.16       .02
14          DP       .00                -.61
15          CG       .00       .00       .00      -.88                 .01      .65
16          OS       .00       .00       .00       .00      -.31       .15
17          OM       .00       .00       .00       .03                -.87      .90
18
19
20    SMALbUS  WDPRICE  PRPRICE  CNPRICE  TDPRICE    XRATE   SUPPLY   DEMAND
First, there are no ERROR terms in the supply and demand elasticity
matrices from symmetry formulas. These would occur if data were missing.

READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

```
    |  A   ||   H   ||   I   ||   J   ||   K   ||   L   ||   M   ||   N   |
1     SMALbUSTRANSMISS.-ELAS.->         1          INCGROW->      .018
2
3   SUPPLY-EL   SUPSUM    S-DSUM
4           MT      .57      1.22
5           DM      .47       .61
6           DP      .28       .89
7           CG      .47      1.34
8           OS      .41       .57
9           OM      .05       .89
10
11  DEMAND-EL       SMT       SDM       SDP       SOM    DEMSUM          DSHRSUM
12          MT                                          -.65
13          DM                            .58           -.14               .58
14          DP                                          -.61
15          CG       .65       .16                      -.87               .81
16          OS                                    .92   -.16               .92
17          OM       .90       .10                      -.84              1.00
18
19
20    SMALbUS   DEMAND   NTRADE CTRAN.EL  WDPT.EL   SSHIFT   DSHIFT   PRSUBW
Next, the SUPSUM (sum of supply elasticities) column is all positive and
the DEMSUM column is all negative.  This makes for a well behaved model.

READY SWOPSIM Tutorial for SMAL          Enter to continue        CAPS
```

If the row sums of the elasticities are of a wrong sign, or unusually large, or differ greatly among products, model solution problems may occur. That is why the visual check is so important. Experience in using a SWOPSIM model will help the user to learn what other things to check for.

	A	H	I	J	K	L	M	N
1	SMALbUSTRANSMISS.-ELAS.->			1		INCGROW->	.018	
2								
3	SUPPLY-EL	SUPSUM	S-DSUM					
4	MT	.57	1.22					
5	DM	.47	.61					
6	DP	.28	.89					
7	CG	.47	1.34					
8	OS	.41	.57					
9	OM	.05	.89					
10								
11	DEMAND-EL	SMT	SDM	SDP	SOM	DEMSUM		DSHRSUM
12	MT					-.65		
13	DM			.58		-.14		.58
14	DP					-.61		
15	CG	.65	.16			-.87		.81
16	OS				.92	-.16		.92
17	OM	.90	.10			-.84		1.00
18								
19								
20	SMALbUS	DEMAND	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW

The elasticities result in a positive S-DSUM = SUPSUM - DEMSUM which should mean the US component of a global SMAL model will be well behaved when solved.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

	A	B	C	D	E	F	G	H
...								
20	SMALbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND
21	MT	2050	1634	3057	1606	1	27972	28361
22	DM	272	301	595	216	1	65432	65432
23	DP	2848	2938	3771	2111	1	3498	3406
24	CG	108	115	99	89	1	221443	153953
25	OS	453	194	207	193	1	59339	42307
26	OM	227	171	214	171	1	26760	22606
...								

Finally, the base data and prices are what they should be and no odd price was created by the support spreadsheet. SMALbUS.CAL is swell.

READY SWOPSIM Tutorial for SMAL Enter to continue CAPS

Once the visual checks of the elasticities and other data in the country model spreadsheet are completed, the model is ready for initialization.

If there would have been problems with base data, then the base data spreadsheets would have to be re-examined and the programs WORK and SUPPORT would have to be re-run. If support data are changed, WORK and SUPPORT must be re-run to update the country model spreadsheet. Remember that because of symmetry formulas, a change in base data might change a cross price elasticity in an unacceptable manner requiring elasticity changes in the upper right half of the elasticity matrix. Again, a visual check would be needed.

At this point in the model building process, all is ready for model initialization. This means that, given the base data and elasticities, intercepts are calculated and equations are written which "fit" the model to the base data. Changes in data or parameters require a repeat initialization.

SWOPSIM TUTORIAL | G - Initialize country model spreadsheets | Screen G1

When all data and elasticities have been entered into the country model spreadsheets and have been checked, the country model spreadsheets must be initialized. If base data, support, or elasticities are changed further in any country model, that spreadsheet must be re-initialized before a new world model is created with new numbers.

Initialization is done by the SWOPSIM program EQUATION which performs two general tasks in a country model spreadsheet. First, equations are written with constant terms fitting the equations to the base data and parameters. Second, indicators such as producer surplus and total welfare are written into the country model spreadsheets.

The tutorial program will use SMALLOOP.BAT to initialize SMALbUS.CAL and SMALbRW.CAL in one fell swoop. The initialized spreadsheets will be copied from D: (where EQUATION leaves them) to C:\SMAL.

```
SMALLOOP EQUATION
Strike a key when ready . . .

    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
...
Writing equations for:  SMALbUS
Doing welfare stuff for model country spreadsheet ---> SMALbUS
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
...
Writing indicators for: SMALbUS
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
...
 Creating ASCII supply, demand elasticity matrices from model SMAL for -> RW
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
...
Writing equations for:    SMALbRW
Doing welfare stuff for model country spreadsheet ---> SMALbRW
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
...
Writing indicators for: SMALbRW
```

The above partial screens indicated the sequence of the initialization program EQUATION. First ASCII files of elasticity values are written to D:. Then these elasticities are used to write equations where they, rather than cell references, are used in the equations (this makes equations self-contained). Finally, indicators are written. Some, such as calculations of economic surplus, also use the elasticities from the first step.

SWOPSIM TUTORIAL | H - Create world model from initialized country model spreadsheets | Screen H1

When all the country model spreadsheets have been successfully initialized, a world model can be created by the SWOPSIM program WORLDMOD. A world model is a three-dimensional spreadsheet with a world solution mechanism on the first page and product rows with equations on subsequent pages, one page to a country. The world model replicates the base data; i.e. when recalculated it does nothing. This is a test of the mechanical validity of a newly created model.

The tutorial program creates the world model SMALWD.CAL and saves it on C:\SMAL. (An optional 1 or 2 digit code can be added to the name to distinguish among world models with different characteristics, but as the tutorial enters no code, the name SMALWD results).

```
WORLDMOD SMAL
Strike a key when ready . . .
```

```
Program to create a world multi-region multi-product model spreadsheet
from country/region spreadsheets.  The spreadsheets must contain base
data, elasticities, and equations before the world model is
created with this program.


Reading master file - SMAL


Countries/regions are:
                                   This is the prompt screen for the program
US RW                              WORLDMOD.  The options include a ceterus paribus
                                   option for countries and/or products in the
                                   world model.  A Yes means that base data is
Product groups are:                entered into the world model rather than a
                                   behavioral equation.
MT DM DP CG OS OM
                                   There is an option in the WORLDMOD program to
Rightmost column is CU             enter a digit when the program is invoked which
                                   will mark this model from others.  This allows the
                                                        user to create many
Hold any country/region constant (Y or N (default))?    world models with
                                                        different assumptions.

Hold constant any product groups (Y or N (default))?
```

```
   2|   A    ||    B    ||    C    ||    D    ||    E    ||    F    ||    G    ||    H    |
1      SMALbUS      1989  XRATE-(LC/US$)->           1  5/26/91           TRANSMISS
...
20     SMALbUS  WDPRICE  PRPRICE  CNPRICE  TDPRICE    XRATE    SUPPLY    DEMAND
Adding [SMALbUS] to SWOPSIM world model --> SMALWD
                   Note that SMALbUS is on page 2 of the world model SMALWD.
```

```
   3|   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1     SMALbRW     1989  XRATE-(LC/US$)->         1  5/26/91          TRANSMISS
...
20    SMALbRW  WDPRICE  PRPRICE  CNPRICE  TDPRICE    XRATE   SUPPLY   DEMAND
Adding [SMALbRW] to SWOPSIM world model --> SMALWD
```

Note that SMALbRW is on page 3 of the world model SMALWD.

```
   1|   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1     SMALWD
2
...
19
20     SMALRW  WDPRICE
Adding world market clearing mechanism to SWOPSIM world model --> SMALWD
```

Note that the world market clearing mechanism is on page 1 of the world model SMALWD.

```
 READY Vernon Oley Roningen, Nielsville, Minn., 56568          CAPS
```

SWOPSIM TUTORIAL	H - Create world model from initialized country model spreadsheets	Screen H2

The world model SMALWD.CAL will be copied to C:\SMAL for permanent keeping and a final view of C:\SMAL is taken. Now all the work has been completed for the creation of a world model. You could load SMALWD, perturb it, and obtain a new world equilibrium. Alternatively, the world model could be prepared for simulation by using the SWOPSIM program FORMULA which prepares simulation options.

```
COPY D:SMALWD.CAL C:\SMAL
       1 File(s) copied
DIR C:\SMAL/W

 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.            ..           SMAL     CAL     SMAL     PRN     SMALBUS  CAL
SMALBRW  CAL     SMALTUS  CAL     SMALTRW  CAL     SMALTHIN XQT     SMALWORK CAL
SMALSUS  CAL     SMALSRW  CAL     SMALADD  XQT     SMALADD  CAL     SMALWD   CAL
      15 File(s)   1290240 bytes free
Strike a key when ready . . .
```

Now a world model, SMALWD.CAL is on the C:\SMAL subdirectory. It is a three-dimensional or a multi-page spreadsheet with the world market clearing mechanism on the first page and rows with equations from the country model spreadsheets on subsequent pages. The world model can be loaded and shocked by removing or changing a price support wedge or shifting a supply or demand schedule. The world model spreadsheet does not contain any indicators (it is a "barebones" set of equations only--this speeds the solution algorithm) so that when a solution is obtained, indicators from the country model spreadsheet must be combined with solution values to study the economic implications of a solution.

There are also program options for setting up a model for solution as well as obtaining a complete set of indicators associated with a model solution. These options are illustrated in the last step I of the SWOPSIM tutorial program SWOPTUT.

SWOPSIM TUTORIAL | I - Simulate world model, observe results | Screen I1

When created, a world model can be called up and unbalanced by shifting a supply or demand curve or removing a policy price wedge. Calculating the spreadsheet will start the solution procedure and it will iterate until world markets are cleared for all products. Solution values can be saved and when the indicators from country model spreadsheets are added and recalculated, the full economic implications of the solution can be studied. The indicators outline the differences between the new balanced state and one represented by the initialized model. All of this can be done manually with spreadsheets or additional programs can be used to simplify the process.

This tutorial will illustrate the solution process by using additional SWOPSIM programs. FORMULA will insert liberalization formulas in SMALWD.CAL and will use them to obtain and save solution values on a file named SMALWM0.cal on C:\SMAL. Then a template spreadsheet SMALSOUT.CAL will be created and used with CUSSOUT, an output program, to examine solution results. This will complete the tutorial.

```
FORMULA SMAL
Strike a key when ready . . .

Program to add a variable, formula, or value to selected product
rows of a world model spreadsheet.  The world model should exist
on the input subdirectory before this program is run.  Lines of
uncompiled basic should be edited to change formula entries.

Reading master file - SMAL


Countries/regions are:

US RW


Product groups are:

MT DM DP CG OS OM


Add projection variables to shift supply/demand (Y or N (default))?


Add formulas to use support wedges for liberalization (Y (default) or N) ?
```

The program FORMULA enters "liberalization" formulas into the model in such a way that all products can be liberalized simultaneously. It also offers the option of inserting projection formulas based on supply growth rates, income and population growth rates, and income elasticities into the supply and demand shifter columns.

```
Products are:

MT DM DP CG OS OM



You have selected:
                                  The tutorial SWOPTUT selects the default ALL
                                  when the Enter key is pressed.
Enter 2 letter product code or 'ALL' (default) for all products
(press 'Enter' for default - press DONE if done entering 2 letter codes)  ?

Omit any countries/regions (Y or N (default))?

    |   A    ||   B    ||   C    ||   D    ||   E    ||   F    ||   G    ||   H    |
1      SMALbUS
...
Inserting formulas for US into: SMALWD

   1|   A    ||   AE   ||   AF   ||   AG   ||   AH   ||   AI   ||   AJ   ||   AK   |
20      SMALWD  WDTRADE            WEIGHT LWDPRICE          WDPRICED WDPRICE%
21       MT           0                .8      2050                 0       .00
22       DM           0                 0       272                 0       .00
23       DP           0                .8      2848                 0       .00
24       CG           0                .8       108                 0       .00
25       OS           0                .8       453                 0       .00
26       OM           0                .8       227                 0       .00
...
This is page 1 of SMALWD.CAL containing the world market clearing
mechanism.  The solution is going to be named SMALWM0.

   1|   A    ||   AE   ||   AF   ||   AG   ||   AH   ||   AI   ||   AJ   ||   AK   |
19                SMALWM0 US unilateral liberalization
20      SMALWD  WDTRADE            WEIGHT LWDPRICE          WDPRICED WDPRICE%
21       MT           0                .8      2050                 0       .00
22       DM           0                 0       272                 0       .00
23       DP           0                .8      2848                 0       .00
24       CG           0                .8       108                 0       .00
25       OS           0                .8       453                 0       .00
26       OM           0                .8       227                 0       .00
...
The program FORMULA has entered formulas in cells N21:Q26 on page 2(US
equations).  They will be activated by putting 1s in AJ1:AM1, page 2.

   1|   A    ||   AE   ||   AF   ||   AG   ||   AH   ||   AI   ||   AJ   ||   AK   |
19                SMALWM0 US unilateral liberalization
20      SMALWD  WDTRADE            WEIGHT LWDPRICE          WDPRICED WDPRICE%
21       MT           0                .8      2050                 0       .00
22       DM           0                 0       272                 0       .00
23       DP           0                .8      2848                 0       .00
24       CG           0                .8       108                 0       .00
25       OS           0                .8       453                 0       .00
26       OM           0                .8       227                 0       .00
...
Calculation of the spreadsheet with F9 will start the model solving.
Page 1 shows the change in global trade and world prices.
```

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                    SMALWMO US unilateral liberalization
20          SMALWD  WDTRADE                    WEIGHT LWDPRICE                WDPRICED WDPRICE%
21           MT           0                        .8     2050                       0       .00
22           DM           0   Begin with           0      272                       0       .00
23           DP           0   balanced             .8     2848                      0       .00
24           CG           0   world trade.         .8      108                      0       .00
25           OS           0                        .8      453                      0       .00
26           OM           0                        .8      227                      0       .00
...
Notice that net world trade balances for products (AE21:AE26) first
appear and then are driven to zero as markets clear (continue when WDTRADE=0).
```

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                    SMALWMO US unilateral liberalization
20          SMALWD  WDTRADE                    WEIGHT LWDPRICE                WDPRICED WDPRICE%
21           MT         -24   The sheet is      .8     2062                      12       .57
22           DM       -1139   calculated           0      272                       0       .00
23           DP        -226   and world            .8     3287                    411     14.43
24           CG        -331   trade is out         .8      110                      2      1.98
25           OS        -139   of balance.          .8      445                     -8     -1.76
26           OM        -165                        .8      226                     -1      -.51
...
Notice that net world trade balances for products (AE21:AE26) first
appear and then are driven to zero as markets clear (continue when WDTRADE=0).
```

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                    SMALWMO US unilateral liberalization
20          SMALWD  WDTRADE                    WEIGHT LWDPRICE                WDPRICED WDPRICE%
21           MT          -3                        .8     2062                      12       .59
22           DM        -382   Better!              0      272                       0       .00
23           DP         -69                        .8     3343                    487     17.08
24           CG        -148                        .8      110                      2      2.10
25           OS         -27                        .8      446                     -7     -1.62
26           OM         -20                        .8      226                     -1      -.29
...
Notice that net world trade balances for products (AE21:AE26) first appear
and then are driven to zero as markets clear (continue when WDTRADE=0).
```

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                    SMALWMO US unilateral liberalization
20          SMALWD  WDTRADE                    WEIGHT LWDPRICE                WDPRICED WDPRICE%
21           MT          -1   World prices         .8     2062                      12       .59
22           DM         -87   are moving to        0      272                       0       .00
23           DP         -15   restore the          .8     3362                    514     18.07
24           CG         -31   trade balance        .8      110                      2      2.14
25           OS          -9   for all              .8      446                     -7     -1.59
26           OM          -5   products.            .8      227                     -1      -.22
27
```

Notice in successive screens that WDTRADE is getting smaller for all products and WDPRICE% is approaching a stable level. The model is solving!

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                SMALWMO US unilateral liberalization
20       SMALWD  WDTRADE                 WEIGHT LWDPRICE                 WDPRICED WDPRICE%
21        MT            0                     .8     2062                       12       .59
22        DM           -8    Soon done!       0      272                        0       .00
23        DP           -1                     .8     3368                      520     18.24
24        CG           -3                     .8      110                        2      2.15
25        OS           -1                     .8      446                       -7     -1.58
26        OM            0                     .8      227                        0      -.21
...
Notice that net world trade balances for products (AE21:AE26) first appear
and then are driven to zero as markets clear (continue when WDTRADE=0).
```

```
   1|    A    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                SMALWMO US unilateral liberalization
20     BWDPRICE  WDTRADE                 WEIGHT LWDPRICE                 WDPRICED WDPRICE%
21         2050         0                     .8     2062                       12       .60
22          272         0                      0      272                        0       .00
23         2848         0   DONE!             .8     3368                      520     18.26
24          108         0                     .8      110                        2      2.15
25          453         0                     .8      446                       -7     -1.58
26          227         0                     .8      227                        0      -.21
...
Solution values will be saved on D: as SMALWMO and copied to C:\SMAL.
/SD:SMALWMO,V are the SuperCalc keystrokes required.
```

Now the solution has been calculated and saved. Next, indicators will be added using the SWOPSIM program CUSSOUT to produce customized output.

SWOPSIM TUTORIAL	I - Simulate world model, observe results	Screen I2

In order to use SWOPSIM programs to help calculate results, three programs are required for the program CUSSOUT to be run. First two batch files, SMALSOUT.BAT and SMALROWC.BAT have been put on C:\BATCH (Typed below). Second, a template spreadsheet SMALSOUT which picks off values from another spreadsheet (a 3-D feature of SuperCalc 5) must be created and saved on C:\SMAL. This technology is very useful for output procedures because once "reaching" cells are established in a spreadsheet, they can be rearranged easily for printing convenience.

First, SMALbUS.CAL is copied to D: as 0.CAL. Then an empty spreadsheet is filled with formulas referring to 0.CAL. This is saved on C:\SMAL as SMALSOUT.CAL. CUSSOUT is called for the US to create a formatted output file on D: which can be printed with a PRINT command.

```
TYPE C:\BATCH\SMALSOUT.BAT
IF F%1 == FUS  ECHO S2~V~ >>D:B
IF F%1 == FRW  ECHO S3~V~ >>D:B
TYPE C:\BATCH\SMALROWC.BAT
ECHO PA18:CU26~A18~!~ >>D:B
Strike a key when ready . . .
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1   SMALbUS        1989           SMALWMO   US unilateral liberalization
2
3      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
4      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
5      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
6      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
7      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
8      SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
9
10     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
11     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
12     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
13     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
14     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
15     SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS  SMALbUS
16
17     Formulas were being replicated which reach into another spreadsheet.
18     Once they are set, referring to another spreadsheet, they can be moved
19     around to format the output for your printer.  The ability to reach into
20     solution output spreadsheets allows a user to customized output layouts.
  TEMP1!A1                          Form=O!A1   <-- a formula in cell A1 reaching
Moving Block...                                    into the spreadsheet O,
 26>/Move,Block,I10:CR15,A17,                      cell A1.
MENU  F1:Help  F3:Names  Ctrl-Backspace:Undo  Ctrl-Br MACROncel  CAPS      CALC
```

```
    |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1   SMALbUS        1989           SMALWMO   US unilateral liberalization
2
3      SMALbUS  WDPRICE   PRPRICE   CNPRICE   TDPRICE     XRATE    SUPPLY    DEMAND
4           MT      2050  1633.847  3057.008  1605.904         1     27972     28361
5           DM       272       301  595.2176  216.2708         1     65432     65432
6           DP      2848      2938  3770.775  2110.956         1      3498      3406
7           CG       108  114.6027  98.83912        89         1    221443    153953
8           OS       453  194.3482  207.4301       193         1     59339     42307
9
10     NTRADE CTRAN.EL  WDPT.EL    SSHIFT    DSHIFT    PRSUBW    CNSUBW    IMSUBW
11       -389         1         1         0         0         0         0         0
12          0         1         1         0         0         0         0         0
13         92         1         1         0         0         0         0         0
14      67490         1         1         0         0         0         0         0
15      17032         1         1         0         0         0         0         0
16
17     EXSUBW  SCROSSO  DCROSSO  TDCONST   PRCONST   CNCONST LPRPRICE LCNPRICE
18          0         1         1 .7833678  27.94305  1423.161 1633.847 3057.008
19          0         1         1 .7951133  84.72918  294.2176      301 595.2176
20          0         1         1 .7412065  827.0438  832.7749     2938 3770.775
The template spreadsheet SMALSOUT.CAL has been created with references
to a file O.CAL which will be put on D: when CUSSOUT is called.

READY SWOPSIM Tutorial for SMAL          Enter to continue       CAPS
```

Now the template SMALSOUT.CAL has been prepared. Formulas have been entered and re-arranged, and the template spreadsheet has been tested by calculating it with reference to an O.CAL spreadsheet on the D: drive. SMALSOUT.CAL is saved on C:\SMAL for use with the SWOPSIM output program CUSSOUT.

SWOPSIM TUTORIAL | I - Simulate world model, observe results | Screen I3

Finally, the SWOPSIM program CUSSOUT is called to prepare a file on D: for printing named SMALUSSO.PRN. The spreadsheet version will be on D: as SMALUSSO.CAL. In addition, the one page spreadsheet of solution indicator values will be on D: as SMALUSO.CAL. These files will be copied to C:\SMAL for safekeeping and removed from D: after SMALUSSO.PRN is typed on the screen for you.

This completes the SWOPSIM tutorial. You now have a complete set of files/spreadsheets on C:\SMAL which can be loaded and examined at your pleasure. You can choose to re-run any part of the tutorial as you choose. If you start at step A, the existing files will have to be built up again from the beginning.

Good luck and GOOD SWOPPING!

```
CALL CUSSOUT SMAL US 0
Strike a key when ready . . .
```

	A	B	C	D	E	F	G	H
1	SMALbUS	1989		SMALWM0	US unilateral liberalization			
2								
3	SMALbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND
4	MT	2050	1633.847	3057.008	1605.904	1	27972	28361
5	DM	272	301	595.2176	216.2708	1	65432	65432
6	DP	2848	2938	3770.775	2110.956	1	3498	3406
7	CG	108	114.6027	98.83912	89	1	221443	153953
8	OS	453	194.3482	207.4301	193	1	59339	42307
9								
10	NTRADE	CTRAN.EL	WDPT.EL	SSHIFT	DSHIFT	PRSUBW	CNSUBW	IMSUBW
11	-389	1	1	0	0	0	0	0
12	0	1	1	0	0	0	0	0
13	92	1	1	0	0	0	0	0
14	67490	1	1	0	0	0	0	0
15	17032	1	1	0	0	0	0	0
16								
17	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST	LPRPRICE	LCNPRICE
18	0	1	1	.7833678	27.94305	1423.161	1633.847	3057.008
19	0	1	1	.7951133	84.72918	294.2176	301	595.2176
20	0	1	1	.7412065	827.0438	832.7749	2938	3770.775

```
Gathering solution of SMALWM0 for US
Width:  9  Memory: 2702  Last Col/Row:A1

READY                                                    CAPS
```

The template above is now filled with solution values and saved on C:\SMAL as SMALWM0.CAL (values are saved, not formulas) and as an ASCII file for printing, SMALWM0.PRN. The following two screens show part of SMALWM0.PRN as it is seen when listed with the DOS TYPE command. Note that it has been formatted (via the template SMALSOUT) so that it can be read on an 80-character wide screen. The variables listed are solution values and associated indicators in the order of their appearance in a model file.

```
     |   A   ||   B   ||   C   ||   D   ||   E   ||   F   ||   G   ||   H   |
1    SMALbUS        1989          SMALWMO   US unilateral liberalization
2
3       SMALbUS  WDPRICE  PRPRICE  CNPRICE  TDPRICE     XRATE    SUPPLY    DEMAND
4            MT 2062.199 1633.847 3057.008 1605.904         1     27972     28361
5            DM       272       301 595.2176 216.2708         1     65432     65432
6            DP 3368.075      2938 3770.775 2110.956         1      3498      3406
7            CG 110.3235 114.6027 98.83912        89         1    221443    153953
8            OS 445.8524 194.3482 207.4301       193         1     59339     42307
9
10      NTRADE CTRAN.EL  WDPT.EL   SSHIFT   DSHIFT    PRSUBW    CNSUBW    IMSUBW
11        -389         1         1        0        0 8.847076 8.971525 -19.0960
12           0         1         1        0        0 84.72918 -77.9588         0
13          92         1         1        0        0         0 146.5062         0
14       67490         1         1        0        0 25.60273 .0486663         0
15       17032         1         1        0        0 1.348186 .0945470         0
16
17      EXSUBW  SCROSSO  DCROSSO  TDCONST  PRCONST  CNCONST LPRPRICE LCNPRICE
18           0         1         1 .7833678 27.94305 1423.161 1615.460 3056.440
19           0         1         1 .7951133 84.72918 294.2176 279.6644 580.6524
20    827.0438         1         1 .7412065 827.0438 832.7749 2496.439 3475.720
-- More --
21           0         1         1 .8240741 25.60273 -15.7636 90.91472 100.8025
```

The final screen in SWOPTUT I is a DIR command listing the full subdirectory C:\SMAL. It now contains the master model files; the base data, model, and support spreadsheets; the world model SMALWD.CAL; a solution file for a solution labeled 0; and other files created by the tutorial program. The *.CAL files are SuperCalc 5 files, the *.PRN files are ASCII files that can be typed or printed. The *.XQT files are ASCII SuperCalc 5 macro files.

```
 Volume in drive C is RONINGEN
 Directory of  C:\SMAL

.            <DIR>      5-13-91   8:25a
..           <DIR>      5-13-91   8:25a
SMAL     CAL     3388   5-26-91   7:22a
SMAL     PRN      512   5-26-91   7:22a
SMALBUS  CAL    30441   5-26-91   7:30a
SMALBRW  CAL    30770   5-26-91   7:30a
SMALTUS  CAL     2738   5-26-91   7:24a
SMALTRW  CAL     2740   5-26-91   7:24a
SMALTHIN XQT      256   5-26-91   7:24a
SMALWORK CAL    54015   5-26-91   7:24a
SMALSUS  CAL    31588   5-26-91   7:27a
SMALSRW  CAL    33038   5-26-91   7:28a
SMALADD  XQT       39   5-26-91   7:25a
SMALADD  CAL     7497   5-26-91   7:25a
SMALWD   CAL    15251   5-26-91   7:31a
SMALWMO  CAL     9918   5-26-91   7:32a
SMALSOUT CAL    16106   5-26-91   7:33a
SMALUSSO PRN     7680   5-26-91   7:33a
SMALUSSO CAL    10846   5-26-91   7:33a
SMALUSO  CAL    11931   5-26-91   7:33a
       20 File(s)   1230848 bytes free
C:\>
```

SWOPARM Tutorial: A - Design a Little Armington Model by Preparing a Master Model File LARM.CAL

The sequencing of steps in constructing an Armington type of bilateral trade flow model with SWOPSIM is identical to that outlined in the SWOPTUT tutorial which creates a world net trade model SMAL. However, some screens contain useful information about the Armington model--these screens for some steps in the SWOPARM tutorial follow. Type SWOPARM ALL to see the full tutorial.

ARMINGTON TUTOR	A - Design a Little ARMington model by preparing a master model file LARM	Screen A1

The first step is to pick a 4 digit name for the model. The tutorial selects LARM for LARM demonstration model. Next a subdirectory is created named C:\LARM using the MKDIR command. Then the tutorial runs the command DIR C:\LARM to show you the empty subdirectory.

ARMINGTON TUTOR	A - Design a Little ARMington model by preparing a master model file LARM.CAL	Screen A2

The next step is to create the master model file for LARM and the derived file LARM.PRN which serves as a key to subsequent SWOPSIM operations. Normally, you would create LARM.CAL manually, but now the tutorial will create it for you and save it on the C:\LARM sub-directory where it will be used for subsequent SWOPSIM operations for the model LARM.

Design of LARM: The model LARM will have two regions designated by by the 2 digit codes US and RW, representing the United States and the Rest of the World. It will have 6 products represented by the 2 digit product codes MT (MeaT), DM (Dairy Milk - non traded), DP (Dairy Products - traded), and CG (Coarse Grains - a feed input to the production of MT and DM). Armington products have the 2 digit country code in front of the product code (e.g. USCG, RWCG, etc.).

As the tutorial creates LARM.CAL, observe the messages and information at the bottom of the screen. Follow the prompts given by SuperCalc . .

The Armington model distinguishes each product by country of origin. In SWOPSIM models this means that each product must also have a country code attached to it. This is accomplished by putting the two digit country code in front of the product code for Armington products. This notation is used in the master model file and follows though all SWOPSIM procedures.

The second significant distinction in the Armington model is the use of an elasticity of substitution to create, via formula, the own and cross price elasticities for Armington products. The latter elasticities are created by formula in the normal positions in the demand matrix. The elasticity of substitution and associated information required by the formulas lies to the right of the normal demand and feed share matrix. These differences are shown in selected screens.

```
    | A||B||C||D||E||F||G||H|                                        | AP|| AQ|| AR |
1   LARM      Master model file for LARM (Little ARMington model)   1988
2
3        US RW  -  -  -  -   Country Codes (B3:C3)                        WDPRICE
4                            US - United States
5     MT  D  D IU  .  .  .   RW - Rest of World                      MT   2050
6     DM  D  D IB IN NT  .                                          DM    272
7   USDP  D  D IU OU  .  .   Matrix Codes (B5:C10)                  USDP   2848
8   RWDP  D  D IU OU  .  .   1 - Supply, demand equations created   RWDP   2848
9   USCG  1  1  I  .  .  .   D - same as 1 but supply quantity can  USCG    108
10  RWCG  1  1  I  .  .  .       be included in any demand equation RWCG    108
11     ^  .  .  .  .  .  .   . - no equation
12                                                  Product Codes (D5:F10)
13  Product Codes (A5:A10)                            IU - Input Using
14  MT - MeaT (beef, pork, mutton, poultry)           I  - Input
15  DM - Dairy Milk (fluid non traded milk)           IB - I and iu Both
16  US,RWDP - traded Dairy Products made in US, RW    IN - INput, int. dem
17  US,RWCG - Coarse Grains produced in US, RW        OU - OUtput, int.dem
18  NOTE:  Armington products are denoted by 4 digit  NT - Non-Traded
19         codes (2 for country + 2 for product)
20
A RANGE must be created when LARM.PRN is created later by MAKEPRN.
A1:G11 MUST be the range for LARM with codes for all products/countries.

READY SWOPSIM Tutorial for LARM.          Enter to continue        CAPS
```

```
ARMINGTON TUROR    A - Design a Little ARMington model by          Screen A4
                       preparing a master model file LARM.CAL

   The final step is to create an ASCII LARM.PRN file on C:\LARM.  The
   tutorial does this by invoking the SWOPSIM program MAKEPRN.  LARM.PRN
   should look as follows:  (A good check is to make sure that the first
   letter of the product code - M in MT - in the first column - US - is in
   12345678..... <--COLUMNS          ROWS     position row 7 and column
                                     Row 1    7.  A text editor can be
                                     Row 2    used for this check.
     LARM     Master model           Row 3
                                     Row 4    Since the tutorial program
         US RW  -  -  -  -           Row 5    is infallible, such a check
                                     Row 6    is not necessary for
       MT  D  D IU  .  .  .          Row 7    LARM.PRN.  The tutorial
       DM  D  D IB IN NT  .          Row 8    will type out the actual
     USDP  D  D IU OU  .  .             .     file LARM.PRN for you.
     RWDP  D  D IU OU  .  .
     USCG  1  1  I IN  .  .
     RWCG  1  1  I IN  .  .
        ^  .  .  .  .  .  .
```

Strike a key when ready . . .

The ASCII (LARM.PRN) file for LARM is created by MAKEPRN as was the case with SMAL.PRN. Note in the example in SWOPARM tutorial screen A4 that the M in MT is again in position row 7 and column 7. Also note that Armington products can be mixed in with non-Armington products in a model. When SWOPSIM programs detect a four-digit product code, they assume an Armington product.

	A	B	C	D	E	F	G	H
1	LARMbUS	1988	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	USDP	RWDP	USCG	RWCG	SUPSUM
4	MT	.00	.00	.00	.00	.00	.00	.00
5	DM	ERROR	.00	.00	.00	.00	.00	ERROR
6	USDP	ERROR	ERROR	.00	.00	.00	.00	ERROR
7	RWDP	ERROR	ERROR	ERROR	.00	.00	.00	ERROR
8	USCG	ERROR	ERROR	ERROR	ERROR	.00	.00	ERROR
9	RWCG	ERROR	ERROR	ERROR	ERROR	ERROR	.00	ERROR
10								
11	DEMAND-EL	MT	DM	USDP	RWDP	USCG	RWCG	SMT
12	MT	.00	.00	.00	.00	.00	.00	
13	DM	ERROR	.00	.00	.00	.00	.00	
14	USDP	ERROR	ERROR	ERROR	ERROR	.00	.00	
15	RWDP	ERROR	ERROR	ERROR	ERROR	.00	.00	
16	USCG	ERROR	ERROR	ERROR	ERROR	ERROR	ERROR	
17	RWCG	ERROR	ERROR	ERROR	ERROR	ERROR	ERROR	
18		*Cells whose elasticities will be given by Armington formulas*						
19		*are underlined.*						
20	LARMbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND

Cells that can contain elasticities and/or data are outlined in GRAY (shadow). Later, elasticities and data will be entered.

READY SWOPSIM Tutorial for LARM Enter to continue CAPS

	A	Q	R	S	T	U	V	W
8	USCG							
9	RWCG							
10								
11	DEMAND-EL	VDSUM	DSHARE	OWNPR.	ELASUBS			
12	MT							
13	DM							
14	USDP	0	ERROR	-.5	3			
15	RWDP		ERROR		3			
16	USCG	0	ERROR	-.5	3			
17	RWCG		ERROR		3			
18								
19								

	A	EXSUBW	SCROSSO	DCROSSO	TDCONST	PRCONST	CNCONST	LPRPRICE
20	LARMbUS							
21	MT				0	0	0	1
22	DM				0	0	0	1
23	USDP				0	0	0	1
24	RWDP				0	0	0	1
25	USCG				0	0	0	1
26	RWCG				0	0	0	1
27								

Cells that containing default own price elasticities and elasticities of subsitution for Armington products are shown in gray (shadow).

READY SWOPSIM Tutorial for LARM Enter to continue CAPS

The own and cross price elasticities of demand for Armington products in a SWOPSIM model are created by formulas dependent on overall own price elasticities of demand and an elasticity of substitution. These cells fall along the diagonal of the demand elasticity matrix. See the following screen.

	A	B	C	D	E	F	G	H
1	LARMbUS	1988	XRATE-(LC/US$)->		1	5/26/91		TRANSMISS
2								
3	SUPPLY-EL	MT	DM	USDP	RWDP	USCG	RWCG	SUPSUM
4	MT	.70	.01			-.11	-.00	.00
5	DM	.00	.50			-.04	-.00	.00
6	USDP		-.15	.43				.00
7	RWDP				.00			.00
8	USCG					.55		.00
9	RWCG						.00	.00
10								
11	DEMAND-EL	MT	DM	USDP	RWDP	USCG	RWCG	SMT
12	MT		*Own and cross price elasticities created by*					
13	DM	.00	*Armington formulas are shown in* **shadow** *print.*					
14	USDP	.00		**-.59**	**.09**			
15	RWDP	.00		**2.41**	**-2.91**			
16	USCG	.00	.00	.00	.00	**-.53**	**.03**	
17	RWCG	.00	.00	.00	.00	**2.47**	**-2.97**	
18								
19								
20	LARMbUS	WDPRICE	PRPRICE	CNPRICE	TDPRICE	XRATE	SUPPLY	DEMAND

Final demand shares and elasticities, feed shares for meat/milk production and upper right half of demand elasticity matrix go into LARMbUS.CAL.

ARMINGTON TUTOR	F - Enter/change elasticities - update country model spreadsheet	Screen F3

After all data have been entered into the country model spreadsheets and before they are initialized with EQUATION, it is good to visually check the elasticities. The tutorial program will do this for the country model spreadsheet LARMbUS.CAL.

	A	N	O	P	Q	R	S	T
1	LARMbUS		POPGROW->	.00758		INCOME (M.US$)->		4466515
...								
11	DEMAND-EL	DSHRSUM	FLDSHARE	FLDELAS	VDSUM	DSHARE	OWNPR.	ELASUBS
12	MT							
13	DM	.58	.42	-.20				
14	USDP				12445941	.96	-.61	3
15	RWDP	.00	1.00			.04		3
16	USCG	.81	.19		10754481	.99	-.88	3
17	RWCG	.81	.19			.01		3
18								
19								
20	LARMbUS	PRSUBW	CNSUBW	IMSUBW	EXSUBW	SCROSSO	DCROSSO	TDCONST

The elasticities of substitution for the ARMINGTON products were kept at 3 which resulted in the demand own and cross price elasticities seen earlier.

The screen above shows the own price demand elasticities and the elasticities of substitution (here 3) used to calculate the own and cross price terms for the Armington products DP and CG. Note that it is possible to have a different elasticity of substitution between each Armington product and its substitutes.

ARMINGTON TUTOR | I - Simulate world model, observe results | Screen I1

When created, a world model can be called up and unbalanced by shifting a supply or demand curve or removing a policy price wedge. Calculating the spreadsheet will start the solution procedure and it will iterate until world markets are cleared for all products. Solution values can be saved and when the indicators from country model spreadsheets are added and recalculated, the full economic implications of the solution can be studied. The indicators outline the differences between the new balanced state and one represented by the initialized model. All of this can be done manually with spreadsheets or additional programs can be used to simplify the process.

This tutorial will illustrate the solution process by using additional SWOPSIM programs. FORMULA will insert liberalization formulas in LARMWD.CAL and will use them to obtain and save solution values on a file named LARMWMO.cal on C:\LARM. Then a template spreadsheet LARMSOUT.CAL will be created and used with CUSSOUT, an output program, to examine solution results. This will complete the tutorial.

1	A	AE	AF	AG	AH	AI	AJ	AK
18								
19		LARMWMO US unilateral liberalization						
20	LARMWD	WDTRADE		WEIGHT	LWDPRICE		WDPRICED	WDPRICE%
21	MT	0		.8	2050		0	.00
22	DM	0		0	272		0	.00
23	USDP	0		.1	2848		0	.00
24	RWDP	0		.2	2848		0	.00
25	USCG	0		.3	108		0	.00
26	RWCG	0		.3	108		0	.00
27								
28	*The weights dampen the movement of world prices during solution.*							
29	*The weight for non traded products (here DM) is always set at 0.*							
30	*The weight for net trade products is set at .8 while the default*							
31	*weight for Armington products is set at .1. In this case the*							
32	*weights for the Armington products were increased to speed up the*							
33	*solution for products RWDP, USCG, and RWCG. Typically, an Armington*							
34	*specification yields larger own and cross price elasticities and*							
35	*therefore wider swings of trade and world prices in the solution*							
36	*process. These swings need to be dampened.*							
37								

Notice that for Armington products the solution weights are set at smaller values to dampen world price swings. Now we fine tune.

Armington models offer large own and cross price elasticities for Armington products. Therefore solution problems may arise and typically, larger damping weights are needed to moderate world price swings in the solution process. Note that these weights can be modified as a solution proceeds; this has been done in the above screen.

The last two screens shown are the first page of the solution, and the directory C:\LARM after the SWOPARM tutorial has been completed.

```
   1|    AD    ||    AE    ||    AF    ||    AG    ||    AH    ||    AI    ||    AJ    ||    AK    |
18
19                    LARMWM0 US unilateral liberalization
20     BWDPRICE   WDTRADE                  WEIGHT LWDPRICE                   WDPRICED WDPRICE%
21         2050          0                      .8     2062                         12       .57
22          272          0                       0      272                          0       .00
23         2848          0                      .1     3795    USDP                947     33.24
24         2848          0                      .2     2878    RWDP                 30      1.06
25          108          0                      .3      113    USCG                  5      4.87
26          108          0                      .3      109    RWCG                  1      1.09
27
28
29
30
31
32
33
34
35
36
37
Solution values will be saved on D: as LARMWM0 and copied to C:\LARM.
/SD:LARMWM0,V are the SuperCalc keystrokes required.

READY SWOPSIM Tutorial for LARM          Enter to continue          CAPS
```

The price changes are much larger for US Armington products in this particular solution than for RW Armington products. This is consistent with the Armington assumption itself which allows for imperfect substitution between Armington products. Other mechanical aspects of SWOPARM are identical to those of the SWOPTUT tutorial program and these screens are not shown.

```
 Volume in drive C is RONINGEN
 Directory of  C:\LARM

.            <DIR>          5-21-91   7:15a
..           <DIR>          5-21-91   7:15a
LARM     CAL        3439    5-26-91   7:36a
LARM     PRN         512    5-26-91   7:36a
LARMBUS  CAL       30414    5-26-91   7:43a
LARMBRW  CAL       32384    5-26-91   7:43a
LARMTUS  CAL        2727    5-26-91   7:37a
LARMTRW  CAL        2727    5-26-91   7:37a
LARMTHIN XQT         256    5-26-91   7:38a
LARMWORK CAL       54119    5-26-91   7:38a
LARMSUS  CAL       31001    5-26-91   7:40a
LARMSRW  CAL       30957    5-26-91   7:41a
LARMADD  XQT          39    5-26-91   7:38a
LARMADD  CAL        7497    5-26-91   7:39a
LARMWD   CAL       14892    5-26-91   7:44a
LARMWM0  CAL        9586    5-26-91   7:46a
LARMSOUT CAL       16106    5-26-91   7:46a
LARMUSS0 PRN        7680    5-26-91   7:46a
LARMUSS0 CAL       10566    5-26-91   7:46a
LARMUS0  CAL       11558    5-26-91   7:46a
      20 File(s)   1245184 bytes free
```

Appendix D: Measuring Economic Welfare

Standard Marshallian measures of producer and consumer surpluses are used to evaluate the economic welfare implications of policy and other exogenous changes. The first part of this appendix illustrates in a simple, single-good setting how these measures are calculated in the modeling framework.

SWOPSIM models are characterized by constant elasticity supply and demand equations:

$$Q_s = aP^n \tag{1}$$

$$Q_d = dP^e \tag{2}$$

where, Q_s and Q_d are quantity supplied and demanded, a and d are exogenous supply and demand shifters, P is the price, n is the uncompensated own price elasticity of supply, and e is the uncompensated own price elasticity of demand.

Equations 1 and 2 can be integrated between P_o and P_1 to yield formulas for producer surplus (PS) and consumer surplus (CS) changes, respectively:

$$\Delta PS = \int_{P_0}^{P_1} aP^n dP = \frac{a}{(1+n)} \left(P_1^{(1+n)} - P_0^{(1+n)}\right) \tag{3}$$

$$\Delta CS = \int_{P_0}^{P_1} dP^e dP = \frac{d}{(1+e)} \left(P_1^{(1+e)} - P_0^{(1+e)}\right) \tag{4}$$

Substituting equations 1 and 2 into equations 3 and 4 respectively, we can express the changes in surplus as,

$$\Delta PS = \frac{a}{(1+n)} \left(P_1 Q_{s1} - P_0 Q_{s0}\right) \tag{5}$$

$$\Delta CS = \frac{d}{(1+e)} \left(P_1 Q_{d1} - P_0 Q_{d0}\right) \tag{6}$$

In other words, given a constant elasticity supply (demand) function, the change in producer (consumer) surplus can be expressed as the change in gross producer revenues (consumer expenditures) multiplied by the ratio of the supply (demand) shifter to the uncompensated own price elasticity of supply (demand) plus 1. This rather simple algebraic expression forms the basis for measuring economic welfare changes in the SWOPSIM modeling framework.

What makes this approach especially attractive is its simplicity. It is accurate, yet requires no integral or derivatives to be taken in the spreadsheet--just simple algebra. Moreover, the informational needs are also

very limited: initial and liberalized prices,[1] initial and liberalized quantities, uncompensated own price elasticities, and exogenous shifters, if any. All this information is readily available from the world spreadsheet after the model has solved. Welfare calculations in SWOPSIM are, therefore, done on an ex-post basis.

There are, however, a number of complexities not represented by equations 5 and 6 that are important from a modeling perspective. These include representation of production control policies, introduction of more than one commodity, and the issue of path dependency and the order of integration.

Production Control and Economic Welfare

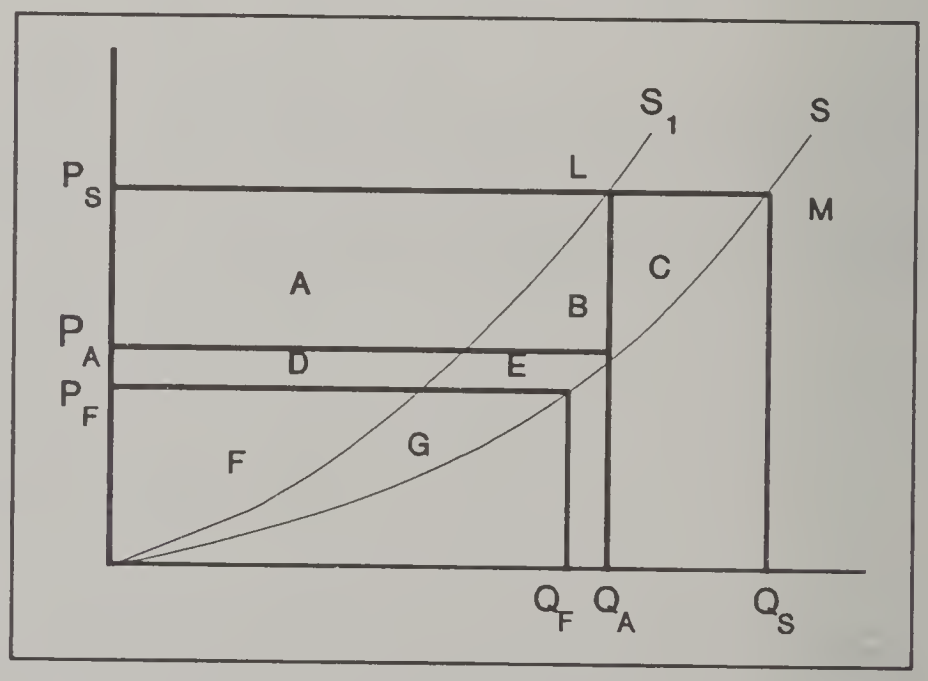
Supply (production) controls are incorporated directly as volume shifters when modeling the sector. Such policies, therefore, would be represented by an additional shifter such as (1+S) in equation 1, and the calculation of the producer surplus in equation 5 would be no different than earlier. Algebraically, the change in producer surplus would be expressed as:

$$\Delta PS = \frac{a(1+s)}{(1+n)} (P_1 Q_{s1} - P_0 Q_{s0}) \qquad (7)$$

where S represents the share of base output withdrawn from production because of supply control restrictions, and all other variables are as defined in equation 4. In terms of figure D1, if producers were required to withdraw LM quantity of output from production to receive support price P_S, then the change in producer welfare from eliminating price supports and producing (Q_F) at the free trade price P_F would be A+D+G.

There are those who argue that producers withdraw the most unproductive land from production (25) so that within a certain range of prices, the supply curve would be perfectly inelastic. In other words, area A+B in figure D1 is treated as a decoupled transfer to producers because unit payment

Figure D1--Production controls (set-asides) in SWOPSIM models



[1]SWOPSIM does have the option of specifying a minimum producer price and a maximum consumer price for purposes of welfare calculations. This restriction yields a supply (demand) curve that is perfectly elastic up to the point where the horizontal line at the minimum (maximum) price intersects the demand curve. Such a provision could be used, for instance, to ensure that liberalized price does not fall below average variable cost.

above P_A does not increase production.[2] If this were the case, the supply curve would have a perfectly inelastic segment between P_A and P_S, and the initial producer welfare would be represented by area A+D+F+B+C+E+G. Eliminating price supports and moving to price P_F would then result in producer surplus changes of A+D+B+E. Hence, if producers are presumed to have withdrawn the most unproductive land out of production rather land of average quality, then the change in producer surplus would be overestimated by B+E+G.

SWOPSIM has provisions to use either alternative when calculating changes in producer welfare. If you wish to use the "tax " approach, calculate the tax equivalent and put it in column BK in the country spreadsheets. To switch to the volume shifter approach, simply set the tax equivalents to zero (29).

Multicommodity Setting

Just, Hueth, and Schmitz have established two alternative approaches to measuring the economic welfare effects of intervention in a multimarket situation (33). One approach is to estimate general equilibrium supply and demand in the market for which a change in policy is considered and in any distorted market for which effects of the change must be taken into account.

An alternative approach is to estimate a system of partial equilibrium supply and demand relationships for all markets for which effects may be substantial. Equilibrium distributional effects can then be determined by solving the system of supply and demand equations for equilibrium prices before and after a change and then sequentially evaluating partial welfare effects on each market group.

SWOPSIM uses the second approach in calculating economic welfare. We do this because the methodology conforms more readily to the partial equilibrium nature of the model. In addition, this approach, unlike the first, also provides us with the equilibrium distributional effects across sectors which are important for policy analysis. To introduce a multicommodity framework into our system, let us rewrite equations 1 and 2 as:

$$Q_s = abP^n \tag{8}$$

$$Q_d = deP^e \tag{9}$$

where, b and e represent indices of cross price and/or quantity effects, and all other variables are as defined earlier. Integrating over P_o and P_1, and substituting as before, we can express the changes in surpluses as:

---

[2] P_A represents the effective price faced by producers after taking into account the tax equivalent of the set-aside. The tax rate is calculated by dividing the set aside ratio by the own price elasticity of supply.

$$\Delta PS = \frac{ab}{(1+n)} (P_1Q_{s1}-P_0Q_{s0}) \quad (10)$$

$$\Delta CS = \frac{de}{(1+e)} (P_1Q_{d1}-P_0Q_{d0}) \quad (11)$$

Equations 10 and 11 are similar to equations 3 and 4, except for terms b and e which represent the cross commodity effects. As can be seen, because equations 10 and 11 use liberalized quantities S_1 and D_1 which already take into account the interactions among the various commodities, the basic formulae for the surplus calculations remain much the same even in a multicommodity setting.

One issue that is not addressed in equations 10 and 11 is that of path dependency. Path dependency refers to a situation where the change in consumer surplus in the case of a multiple price change depends on the order in which these price changes are considered. Thus, there is an ambiguity in determining the consumer surplus change associated with a multiple price change. This ambiguity would, however, disappear if income effects of all goods for which prices change are zero, as would be the case for the Hicksian compensated demand system.

The path dependency, or the order of integration, problem cannot be dealt with directly when using the SWOPSIM system. SWOPSIM uses a default integration formula and does not allow experiments with the order of integration. To examine the impact of the order of integration on welfare measurement, Haley and Dixit developed a solution procedure where the price path used for integration could be changed (25). Their results indicate that path dependency is not a problem for SWOPSIM (version ST86) in that the variations in welfare measurements were not all that different among the various price path chosen. They surmise that one reason for this may be the small cross price elasticities of demand in the modeling framework. Another reason may be the low income elasticities of demand for the commodities included.

Derivation of Changes in Producer/Consumer Surplus Measures in SWOPSIM

For derivation of the changes in producer surplus measures for constant elasticity functions that are in SWOPSIM models, notation definitions are:

$Q_{0,1}$	quantity supplied in initial equilibrium ($_0$) and new solution equilibrium ($_1$)
P	producer incentive price (with P0 denoting price at initial equilibrium, P1 the price at the new solution, and Pb a minimum price below which production would cease (the constant elasticity supply curve would assume that the price could drop to zero)
$C_{0,1}$	constant term in equation where C_1 includes any shifts in supply due to other factors including cross price effects
d	differential
ln	natural log
Sc	producer surplus change
s	own price supply elasticity

The producer surplus change measure (Sc) is calculated by subtracting the differences in the integral of the supply curve evaluated at new and base equilibrium:

(a) $Q_0 = C_0 P^s$ (b) $Q_1 = C_1 P^s$

(c) $Sc = \int_{Pb}^{P1} Q_1 \, dP - \int_{Pb}^{P0} Q_0 \, dP$

where Pb = Pshr*MIN(P0,P1), 0<=Pshr<=1 (default Pshr= .5)

Evaluating the integral (c):

(d) $Sc = [1/(1+s)] \, C_1 P^{1+s} \Big|_{Pb}^{P1} - [1/(1+s)] \, C_0 P^{1+s} \Big|_{Pb}^{P0}$ if $s \neq -1$

(e) $Sc = C_1 \ln(P) \Big|_{Pb}^{P1} - C_0 \ln(P) \Big|_{Pb}^{P0}$ if $s = -1$

Substituting:

(f) $Sc = [1/(1+s)] \, [(C_1 P_1^{1+s} - C_0 P_0^{1+s}) - P_b^{1+s} (C_1 - C_0)]$ if $s \neq -1$

(g) $Sc = C_1 \ln(P1) - C_0 \ln(P0) - \ln(Pb) (C_1 - C_0)$ if $s = -1$

Substituting from (a) and (b) into (f) and (g):

(h) $Sc = [1/(1+s)] \, \{(P_1Q_1 - P_0Q_0) - P_b^{1+s}[(Q_1/P_1^s) - (Q_0/P_0^s)]\}$ if $s \neq -1$

(i) $Sc = P_1Q_1 \, [\ln(P1) - \ln(Pb)] - P_0Q_0 \, [\ln(P0) - \ln(Pb)]$ if $s = -1$

Equations (h) and (i) are the ones actually used for producer surplus change calculations in SWOPSIM models. For consumer surplus change calculations, the derivation is identical, given the following definitions or changes in the above definitions and/or identities:

Cc consumer surplus change, where Cc = - Sc in above equations
P now a consumer incentive price, where Pb = MAX(P0,P1)
and s now a own price elasticity of demand

The surplus change equations are written by the last step (EQNC) of the SWOPSIM EQUATION program. Since the formulas require elasticities, any change in own price elasticities means that the surplus equations will have to be re-written by the EQUATION program. If the elasticities equal minus one, the program automatically uses the alternative equation forms shown above. Finally, an adjustment is made in the indicators for the situation where a cut in price would close out production of a product rather than cut back. This is done by not counting producer surplus below a minimun amount. Also, adjustments are made on surplus changes associated with products that are inputs to other products (25). The idea is to avoid obvious double counting when adding surplus across products.

It should be noted that the welfare calculation also uses measures of change in government revenue and should account for changes in quota rents. The SWOPSIM indicators include measures for this purpose, but the user should take care when using them since they are not as "cut and dried" as the surplus calculations. The allocation of quota rents typically requires sound knowledge of the economics of the market being modeled.

Appendix E--Installation of the SWOPSIM Modeling Framework

The SWOPSIM modeling framework comes on a disk and is self-installing. Instructions for installation are on the disk as screens activated with the READSWOP command. These screens are presented below. Screen 1 summarizes the hardware and software requirements for SWOPSIM.

```
SWOPSIM Installation    Software and Hardware Requirements    Screen 1

SPREADSHEET:  SuperCalc 5, version D, installed on C:\SC5.

MEMORY:  At least 2MB of RAM memory available to SuperCalc 5 as EXPANDED
         memory.  This usually requires an Expanded Memory System program
         (often machine specific) included in the CONFIG.SYS file.  3-4MB
         RAM is desirable.  Need at least 3MB of fixed disk space on C:.

PATH:  PATH command in AUTOEXEC.BAT should include C:\;C:\BATCH;C:\SC5;
       as well as subdirectory containing DOS commands.

DOS:  DOS 3.3 or larger (must include CALL as DOS command).

DRIVE:  D: MUST be designated as a drive.  D: is used for all temporary
        output for SWOPSIM operations.  A virtual D: drive from a VDISK
        program speeds SWOPSIM operations.  An alternative is to use the
        DOS SUBST command to designate a fixed disk partition as D:.
```

The second screen summarizes the SWOPSIM installation instructions. Note that the automatic installation procedure installs the necessary files but does not install uncompiled BASIC programs or the models created by the tutorials.

```
SWOPSIM Installation    Installation Instructions    Screen 2
                        (AUTOMATIC installation recommended)

AUTOMATIC:  Log to installation drive (e.g. A:) and type SWOPINS A:
            (SWOPINS B: if using B: drive).  Automatic INS

MANUAL:  The SWOPSIM disk contains self-unPACking PACked files.  Create
         the required subdirectory, copy the *.EXE file to it, log onto
         the subdirectory, execute the file (e.g. if file is SWOPSIM.EXE,
         type SWOPSIM), and after the file has unPACked, erase it to save
         space.  Files MUST (except Optional=O) be unPACked as follows:
         BASPROG.EXE --> C:\    BATCH.EXE --> C:\BATCH
         SWOPSIM.EXE, SWOPBAS.EXE (O) --> C:\SWOPSIM
         SMALSWOP.EXE (O) --> C:\SMAL    LARMSWOP.EXE (O) --> C:\LARM

INFORMATION:  SWOPSIM operations are run by DOS BATCH programs stored on
              C:\BATCH.  Many operations run compiled BASIC (*.EXE)
              programs kept on C:\SWOPSIM.  ALL SWOPSIM operations are
              run FROM C:\.  Use CAPITAL letters for SWOPSIM operations.
```

The third screen gives suggestions and sources of available help for SWOPSIM model building.

```
SWOPSIM Installation          Help Available                Screen 3

SWOPTEAM:  Praveen Dixit, John Sullivan, Vernon Roningen - ATP, ATAD,
           ERS, USDA, Room 624, 1301 New York Avenue NW, Washington,
           DC 20005-4789.  Phone (202)-219-0634, Fax (202)-219-0942.

PUBLICATIONS:  "Overview of the Static World Policy Simulation (SWOPSIM)
               Modeling Framework", ERS USDA Staff Report No. AGES 9114.

TUTORIALS:  Type SWOPTUT for a tutorial on constructing a SMALl SWOPSIM
            world net trade model named SMAL.  Type SWOPARM for the
            construction of a Little ARMington SWOPSIM model LARM.

DEMO:  A DEMOnstration model for three regions and 22 products is
       included on the installation disk.  DEMO is documented in the
       "Overview" publication and can serve as a beginning point for
       SWOPSIM model building.  DEMO is installed on C:\DEMO as part
       of the SWOPINS.BAT routine or it may be installed by DEMOINS.BAT.
```

The demonstration model DEMO is automatically installed with the SWOPSIM software. It may also be installed manually as suggested by the following screen with comes with the model. DEMO is a "real-world" model that can be used for liberalization experiments. It follows the standard 22-product structure used for many SWOPSIM models and has a well developed set of output and analysis routines.

```
Installation of the SWOPSIM model -->  DEMO          Screen 1

AUTOMATIC:  From A:, type DEMOINS A: (or DEMOINS B: from B: drive).

MANUAL:  Create C:\DEMO with MKDIR.  Copy *.EXE files to C:\DEMO, unPACk,
         and delete *.EXE files to save space.  Files are (O = optional):
         DEMOMAS.EXE  Master model, base data, and miscellaneous files
         DEMODAT.EXE  Country/region model spreadsheets
         DEMOPSE.EXE  Country/region support spreadsheets
         DEMOOUT.EXE  Sophisticated output templates for model DEMO
         DEMOWD.EXE   (O) World model spreadsheet
         DEMOSOL.EXE  (O) Illustrative solution file for world model DEMO

         In addition, DEMOBAT.EXE must be unPACked onto C:\BATCH.

         ELASPRN.EXE (O) and DATAPRN.EXE (O) may be unPACked somewhere to
         view or print PRN files of DEMO elasticities, base data, and
         support information.  Good luck and good DEMOing!
```

Appendix F--Annotated Listing of SWOPSIM Computer Programs

Models built with the SWOPSIM framework reside in spreadsheets. Data and model manipulations are done by spreadsheet macro commands. The SWOPSIM modeling framework is a set of compiled BASIC computer programs and DOS batch programs which do these manipulations.

Complex spreadsheet operations which require repetitive operations for countries and/or products typically are done with compiled BASIC programs. The BASIC programs, when invoked, write out sets of macro (*.XQT) files on the D: drive which, when executed in SuperCalc 5, carry out the spreadsheet operations. The control of the compiled BASIC programs, the invocation of SuperCalc, and the management of input and output data from these operations are all managed by DOS batch programs. In some cases in which less complex macro instruction sets are needed, the DOS batch programs themselves write macros directly and compiled BASIC programs are not used.

DOS batch programs are stored in ASCII format and can be written and modified with any text editor. The BASIC programs are written in IBM or GW interpretive BASIC. When complete, they are written out in ASCII format and compiled into *.EXE executable programs with a MicroSoft BASIC compiler. This insures their speedy operation. The slowest part of any SWOPSIM operation is typically the execution of the macros in the spreadsheets themselves.

When a SWOPSIM operation is complete, the macros created by the BASIC (EXE) or DOS batch (BAT) programs are deleted automatically. The SWOPSIM installation program installs the DOS batch programs and the compiled BASIC programs. The uncompiled basic programs are also on the installation disk and can be manually installed in the SWOPSIM subdirectory if the user wishes to change them and re-compile them.

The DOS batch programs are self documenting in that each has an explanatory screen with prompts. Typing the program name without giving the required codes invokes the explanatory screen. The BASIC programs also give screen information which tells what is happening and sometimes prompt the user for input. In addition, REM comments in the BASIC programs often document a particular segment of the program. The name invoked when carrying out a SWOPSIM operation is the name of the controlling DOS batch program. In most cases, the DOS and BASIC programs have the same name but there are occasions when one DOS program controls more than one BASIC program and there are cases, especially for output programs, where DOS batch programs do the entire job.

This appendix contains listings of SWOPSIM DOS and BASIC programs. The listings are readable and serve as documentation, especially considering the comments contained in the listings themselves. The documentation is organized by showing the screen prompt one sees when the program name is invoked (this screen gives an overview of the program), a listing of the DOS controlling batch program, and finally, an ASCII listing of the BASIC program(s) invoked by the DOS batch controlling program.

When SWOPSIM is installed, a few SuperCalc 5 (*.CAL) files are also included. These generally are pre-prepared templates which are used for some SWOPSIM operations (mainly for 22-product standard models). In some cases, when new models are created, some of these templates may have to be customized. In these latter cases, a second program is listed with the same name preceded by the letters CUS. Where programs operate on a country spreadsheet, looping

programs created by the CREATE program can loop through the operation for all countries in a model.

A list of the programs and their purposes follows.

Model spreadsheet construction programs .....

MAKEMAS	Make part of a master model file by answering questions
MAKEPRN	Make PRN file from master model file
CREATE	Create country model spreadsheets from information in master model file
CREATEWK	Create template for country model spreadsheet from information in master model file
BLANK	Blank out unwanted formulas and modify standard model spreadsheet
CUSBLANK	Blank out unwanted formulas and modify non-standard model spreadsheet

Model spreadsheet updating programs .....

WORK	Update country support spreadsheet using template created by CREATEWK
SUPPORT	Add support price wedges from country support spreadsheet and base data from base data spreadsheet to country model spreadsheet
EQUATION	Initialize country model spreadsheet to base data and parameters by calculating constant terms, writing equations, and adding indicators

World model creation/preparation programs .....

WORLDMOD	Create multi-country, multi-product world model from country model spreadsheets
COMODMOD	Create single product (commodity) world model from country model spreadsheets
FORMULA	Insert liberalization and/or projections formulas into world model

Spreadsheet/model output programs .....

EOUT	Output elasticities for standard model spreadsheet
CUSEOUT	Output elasticities for customized model spreadsheet
BOUT	Output base quantity, price, and support data for standard model
CUSBOUT	Output base quantity, price, and support data for customized model
SOUT	Output solution values for a country from the standard world model
CUSSOUT	Output solution values for a country from a customized world model
TABLE	Output a table of variables for all countries from a model spreadsheet, a support spreadsheet, or a model solution spreadsheet created by SOUT or CUSSOUT
PALLWORK	Print entire country model support spreadsheet

Utility programs (sometimes used in batch procedures) .....

RWORD	Replace a selected word in an ASCII file
EQWRITE	Write a SuperCalc 5 macro to re-create an equation put out as a PRN file
DEMOREPL	Create a set of files for a new (standard) model by cloning them from files existing for the demonstration model DEMO
FIXFORM	Reset SuperCalc 5 spreadsheet defaults for selected spreadsheet

Aggregation programs .....

AGMOD	Aggregate elasticities from existing country model spreadsheets
AGSUP	Aggregate support information from existing country support spreadsheets
AGDAT	Aggregate quantity data from existing country base data spreadsheets
AGVAR	Aggregate a selected variable over countries from country model spreadsheets, country support spreadsheets, or country solution spreadsheets created by SOUT or CUSSOUT

Installation programs .....

READSWOP	Provide screens of information about installing SWOPSIM from the installation disk
READDEMO	Provide a screen of information about installing the demonstration model DEMO from the installation disk
SWOPINS	Install SWOPSIM from the installation disk

Regional share calculation programs .....

USREGION	Calculate region/state shares of solution for the US
ECREGION	Calculate region/country shares of solution for EC

Tutorial programs .....

SWOPTUT	Invoke a tutorial for the creation and exercise of a small net trade model SMAL and set SuperCalc 5 spreadsheet defaults
SWOPARM	Invoke a tutorial for the creation and exercise of a small bilateral (Armington) trade flow model LARM and set SuperCalc 5 spreadsheet defaults

Programs will be annotated by comments in italics. Annotation will occur in the first program listed (CREATE) to highlight the structure of selected parts of the program, and only selectively thereafter. The layout of the programs will be as follows (in double column format):

A screen print of the instructions seen
when a program's name is invoked

A listing of the DOS batch program which controls the operation

A listing of the (ASCII) BASIC program(s) which are called by the batch program. These BASIC programs will be found on the installation disk compressed as the SWOPBAS.EXE program. When executed, this program will free all of the BASIC programs which can be read by GW or IBM BASIC.

The DOS batch programs contain some documentation or "reminders" in the form of REM statements. The BASIC programs also contain REM comment statements as well as comments after operational BASIC statements when preceded by a ' mark. Remember that all SWOPSIM programs driven or controlled by DOS batch commands have instruction screens which appear when the program name is entered. In addition, many batch programs have error traps which inform the user of missing files or steps that need to be taken before running a program.

```
            Program to help prepare a master model file
-------------------------------------------------------------------------
MAKEMAS     Program to help create a master model file in response to
            questions.  The user must add world reference prices in
            column AR and appropriate equation markets in the dotted
            (.) areas.  The program prompts for a model NAME and also
            creates batch files NAMEROWC.BAT and NAMESOUT.BAT which
            are required for customized output (these should be saved
            to the C:\BATCH subdirectory).  The master model file
            NAME.CAL should be saved on the C:\NAME subdirectory after
            appropriate information is added.  Customized output
            templates (NAMESUPD.CAL, NAMEBASE.CAL, and NAMESOUT.CAL)
            are created and should be save, if wanted, on C:\NAME.
            The templates are required for customized output programs.
            They can be rearranged with the SC5 commands to move blocks
            of a spreadsheet and can (and should) be edited.  They
            contain formulas reaching into other spreadsheets.
REQUIREMENTS None
OUTPUT (D:) NAME.CAL, NAMEROWC.BAT, NAMESOUT.BAT, NAMESUPD.CAL,
            NAMEBASE.CAL, and NAMESOUT.CAL
-------------------------------------------------------------------------
MAKEMAS
-------------------------------------------------------------------------
```

```
:MAKEMAS
ECHO OFF
CLS
ECHO             Program to help prepare a master model file
ECHO -------------------------------------------------------------------------
ECHO MAKEMAS     Program to help create a master model file in response to
ECHO             questions.  The user must add world reference prices in
ECHO             column AR and appropriate equation markets in the dotted
ECHO             (.) areas.  The program prompts for a model NAME and also
ECHO             creates batch files NAMEROWC.BAT and NAMESOUT.BAT which
ECHO             are required for customized output (these should be saved
ECHO             to the C:\BATCH subdirectory).  The master model file
ECHO             NAME.CAL should be saved on the C:\NAME subdirectory after
ECHO             appropriate information is added.  Customized output
ECHO             templates (NAMESUPD.CAL, NAMEBASE.CAL, and NAMESOUT.CAL)
ECHO             are created and should be save, if wanted, on C:\NAME.
ECHO             The templates are required for customized output programs.
ECHO             They can be rearranged with the SC5 commands to move blocks
ECHO             of a spreadsheet and can (and should) be edited.  They
ECHO             contain formulas reaching into other spreadsheets.
ECHO REQUIREMENTS  None
ECHO OUTPUT (D:)   NAME.CAL, NAMEROWC.BAT, NAMESOUT.BAT, NAMESUPD.CAL,
ECHO             NAMEBASE.CAL, and NAMESOUT.CAL
ECHO -------------------------------------------------------------------------
ECHO MAKEMAS
ECHO -------------------------------------------------------------------------
PAUSE
IF EXIST D:*.CAL ERASE D:*.CAL
C:\SWOPSIM\MAKEMASF
CALL SC D:TEST
ERASE D:TEST.XQT
CLS
CALL SC D:TEST1.XQT
ERASE D:TEST1.XQT
ERASE D:O.CAL
ERASE D:W.CAL
CLS
CALL SC D:TEST2.XQT
ERASE D:TEST2.XQT
ERASE D:B.CAL
CLS
CALL SC D:TEST3.XQT
ERASE D:TEST3.XQT
ERASE D:B.CAL
ERASE D:S.CAL
CLS
DIR D:/W
:END ECHO ON
```

```
10 CLS
20 PRINT:PRINT"MAKEMASF - Program to help MAKE a MASter model File":PRINT
30 REM MAKEMASF  Program to write a SWOSPIM master model file in response to
40 REM           prompts.  Documentation should be added manually.  The
50 REM           columns containing the equation codes should be width 3, but
60 REM           the rest is up to the user.
70 PRINT
80 WSQ$="~"
90 INPUT"Enter 4 character (letter) model NAME ";NM$
100 IF LEN(NM$)=4 GOTO 140
110 PRINT:PRINT
120 PRINT"Your NAME was not 4 characters long! Try again."
130 GOTO 70
140 PRINT:PRINT"Your model name is ";NM$;:INPUT"    Is this okay (Y-default or
N)";Y$
150 IF LEFT$(Y$,1)="N" GOTO 70
160 CLS
170 PRINT:INPUT"Enter number of countries";NC
180 IF NC<2 GOTO 200
190 GOTO 220
200 PRINT:PRINT"You entered less that 2 countries/regions! You need at least 2."
210 GOTO 160
220 PRINT:PRINT"You entered ";NC;" countries/regions.":PRINT:INPUT"    Is this
okay (Y-default or N)";Y$
230 IF LEFT$(Y$,1)="N" GOTO 170
240 DIM CY$(0,123)
250 DIM PR$(0,90)
260 PRINT:PRINT"Now enter the 2 digit country codes for all countries except
RW":PRINT
270 FOR I=1 TO NC-1
280 PRINT"Enter 2 digit code for country/region # ";I;:INPUT" ";CY$(0,I)
```

```
290 NEXT I
300 CY$(0,NC)="RW"
310 CLS
320 PRINT
330 INPUT"Enter number of products";NP
340 IF NP<1 OR NP>88 GOTO 350 ELSE GOTO 370
350 PRINT:PRINT"Number of products must be between 1 and 88! Try again."
360 GOTO 320
370 PRINT:PRINT"You entered ";NP;" products.":PRINT:INPUT"    Is this okay
(Y-default or N)";Y$
380 IF LEFT$(Y$,1)="N" GOTO 320
390 PRINT:PRINT"Now enter the 2 digit (4 for Armington) product codes for all
products":PRINT
400 FOR I=1 TO NP
410 PRINT"Enter product code for product # ";I;:INPUT" ";PR$(0,I)
420 NEXT I
430 CLS:PRINT
440 PRINT"Writing macros to create and format Master Model file for ";NM$
450 PRINT:PRINT"If you use this master model file, enter the equation codes and"
460 PRINT"save it on the D: drive.  If you are creating a non-standard (other
than"
470 PRINT" 22 products), save the other files created as well as they are used
by "
480 PRINT"the customized output programs CUSEOUT, CUSBOUT, and CUSSOUT.":PRINT
490 OPEN"O",1,"D:TEST.XQT"
500 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
510 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
520 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
530 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
540 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
550 LCL=LEN(CL$)/2
560 DIM CLM$(0,123)
570 FOR I=1 TO LCL '122 COLUMNS MAX.
580 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
590 W$="{MACRO}":GOSUB 1700
600 W$="{WINDOWSOFF}:GOSUB 610
610 W$="{PANELOFF}:GOSUB 610
620 W$="{STATUS "+CHR$(34)+"Preparing master model file for model
"+NM$+CHR$(34)+"}":GOSUB 1690
630 W$="{PROMPT "+CHR$(34)+"with"+STR$(NP)+" products and"+STR$(NC)+"
countries/regions"+CHR$(34)+"}":GOSUB 1690
640 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minnesota
56568"+CHR$(34)+"}":GOSUB 1690
650 W$="/FG,TR":GOSUB 1680
660 W$="{LETC AR1,World}":GOSUB 1680
670 W$="{LETC AR2,price}":GOSUB 1680
680 W$="{LETC AR3,WDPRICE}":GOSUB 1680
690 W$="/PAR":GOSUB 1680
700 FOR I=1 TO NP
710 S$=RIGHT$(STR$(I+4),LEN(STR$(I+4))-1)
720 S1$=RIGHT$(STR$(I),LEN(STR$(I))-1)
730 W$="{LET AR"+S$+",WDPrice"+S1$+"}":GOSUB 1690
740 NEXT I
750 ECOL$=MID$(CL$,(NP+4)*2+1,2)
760 W$="/FCA:"+ECOL$+",W3":GOSUB 1660
770 W$="{LETC A1,"+NM$+"}":GOSUB 1690
780 W$="{BEEP}":GOSUB 1690
790 W$="/FEA1,TL":GOSUB 1690
800 W$="/PA1":GOSUB 1680
810 FOR I=1 TO NC
820 W$="{LETC"+MID$(CL$,(I-1)*2+3,2)+"3,"+CY$(0,I)+"}":GOSUB 1690
830 NEXT I
840 FOR I=NC+1 TO NC+3
850 W$="{LETC"+MID$(CL$,(I-1)*2+3,2)+"3,-}":GOSUB 1690
860 NEXT I
870 FOR I=1 TO NP
880 W$="{LETC A"+RIGHT$(STR$(I+4),LEN(STR$(I+4))-1)+","+PR$(0,I)+"}":GOSUB 1690
890 W$="{LETC AQ"+RIGHT$(STR$(I+4),LEN(STR$(I+4))-1)+","+PR$(0,I)+"}":GOSUB 1690
900 NEXT I
910 FOR I=NP+1 TO NP+1
920 W$="{LETC A"+RIGHT$(STR$(I+4),LEN(STR$(I+4))-1)+",^}":GOSUB 1690
930 NEXT I
940 W$="/PA":GOSUB 1680
950 W$="/PAQ":GOSUB 1680
960 W$="/P3":GOSUB 1680
970 FOR J=1 TO NC+3
980 FOR I=1 TO NP+1
990 W$="{LET
"+MID$(CL$,(J-1)*2+3,2)+RIGHT$(STR$(I+4),LEN(STR$(I+4))-1)+","+CHR$(34)+"."+CHR$
(34)+"}":GOSUB 1690
1000 NEXT I
1010 NEXT J
1020 W$="{LETC E1,"+CHR$(34)+"Master model file for "+NM$+" [be sure to add
world reference"
1030 W$=W$+" prices in column AR and equation markings, where desired, to
replace"
1040 W$=W$+" the dots (.)]"+CHR$(34)+"}":GOSUB 1690
1050 W$="/FEE1,TL":GOSUB 1690
1060 W$="/SD:"+NM$+",A":GOSUB 1690
1070 W$="/Q,Y":GOSUB 1690
1080 CLOSE 1
1090 BAT$="D:"+NM$+"ROWC.BAT":OPEN"O",1,BAT$
1100 TR$=STR$(2*NP+6):TR$=RIGHT$(TR$,LEN(TR$)-1)
1110 BR$=STR$(3*NP+8):BR$=RIGHT$(BR$,LEN(BR$)-1)
1120 W$="ECHO PA"+TR$+":CU"+BR$+"~A"+TR$+"~!~ >>D:B":GOSUB 1700
1130 CLOSE 1
1140 BAT$="D:"+NM$+"SOUT.BAT":OPEN"O",1,BAT$
1150 FOR I=1 TO NC
1160 W$="IF F%1 == F"+CY$(0,I)+" ECHO S"+RIGHT$(STR$(I+1),LEN(STR$(I+1))-1)+"~V~
>>D:B":GOSUB 1700
1170 NEXT I
1180 CLOSE 1
1190 BAT$="D:TEST1.XQT":OPEN"O",1,BAT$
1200 W$="{MACRO}":GOSUB 1700
```

```
1210 W$="/SD:O,A":GOSUB 1690
1220 W$="/SD:W,A":GOSUB 1690
1230 AR$=STR$(2*NP+7):AR$=RIGHT$(AR$,LEN(AR$)-1)
1240 W$="{LETC A1,"+CHR$(34)+"O!A1"+CHR$(34)+"}":GOSUB 1690
1250 W$="{LETC B1,"+CHR$(34)+"O!B1"+CHR$(34)+"}":GOSUB 1690
1260 W$="{LETC D1,"+CHR$(34)+"W!AE"+AR$+CHR$(34)+"}":GOSUB 1690
1270 W$="{LETC E1,"+CHR$(34)+"W!AF"+AR$+CHR$(34)+"}":GOSUB 1690
1280 FOR I=1 TO NP+1
1290 AR$=STR$(2+I):AR$=RIGHT$(AR$,LEN(AR$)-1)
1300 WR$=STR$(2*NP+7+I):WR$=RIGHT$(WR$,LEN(WR$)-1)
1310 W$="{LETC A"+AR$+","+CHR$(34)+"O!A"+WR$+CHR$(34)+"}":GOSUB 1690
1320 NEXT I
1330 TR$=STR$(3):TR$=RIGHT$(TR$,LEN(TR$)-1)
1340 BR$=STR$(3+NP):BR$=RIGHT$(BR$,LEN(BR$)-1)
1350 W$="/RA"+TR$+":A"+BR$+"~B"+TR$+":CZ"+TR$:GOSUB 1690
1360 W$="{CALC}":GOSUB 1690
1370 W$="/SD:"+NM$+"SOUT,A":GOSUB 1690
1380 W$="/Q,Y":GOSUB 1690
1390 CLOSE 1
1400 BAT$="D:TEST2.XQT":OPEN"O",1,BAT$
1410 W$="{MACRO}":GOSUB 1700
1420 AR$=STR$(2*NP+6):AR$=RIGHT$(AR$,LEN(AR$)-1)
1430 W$="/SD:B,A":GOSUB 1690
1440 W$="{LETC A1,"+CHR$(34)+"B!A1"+CHR$(34)+"}":GOSUB 1690
1450 W$="/RA1:A1,A2:A"+AR$:GOSUB 1690
1460 TC$=MID$(CL$,(2*NP)*2+7,2)
1470 W$="/RA1:A"+AR$+",B1:"+TC$+"1":GOSUB 1660
1480 W$="{CALC}":GOSUB 1690
1490 W$="/SD:"+NM$+"SUPD,A":GOSUB 1690
1500 W$="/Q,Y":GOSUB 1690
1510 CLOSE 1
1520 BAT$="D:TEST3.XQT":OPEN"O",1,BAT$
1530 W$="{MACRO}":GOSUB 1700
1540 AR$=STR$(2*NP+16):AR$=RIGHT$(AR$,LEN(AR$)-1)
1550 W$="/SD:B,A":GOSUB 1690
1560 W$="/SD:S,A":GOSUB 1690
1570 W$="{LETC A1,"+CHR$(34)+"S!A1"+CHR$(34)+"}":GOSUB 1690
1580 W$="/RA1:A1,A2:A"+AR$:GOSUB 1690
1590 W$="/RA1:A"+AR$+",B1:AB1"+AR$:GOSUB 1690
1600 W$="{CALC}":GOSUB 1690
1610 W$="/SD:"+NM$+"BASE,A":GOSUB 1690
1620 W$="/Q,Y":GOSUB 1690
1630 CLOSE 1
1640 SYSTEM
1650 END
1660 PO=INSTR(W$," "):IF PO=0 THEN 1680 'REMOVE BLANKS FROM STRING
1670 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 1660
1680 PRINT #1,W$;WSQ$:RETURN 'SUBROUTINE TO PRINT W$ STRING
1690 PRINT #1,W$;WSQ$:RETURN 'PRINT W$ WITH BLANKS
1700 PRINT #1,W$:RETURN 'PRINT STRING WITHOUT WSQ$
```

The MAKEMAS program is a useful way to start building a master model file.

```
                Program to write SC5 equation macro
-------------------------------------------------------------------------
MAKEPRN         Program to MAKE a PRN file from the master model file NAME
                for use in CREATE and other SWOPSIM programs
REQUIREMENTS    Model NAME master file must be on C:\NAME subdirectory.
                You MUST set the correct range in the NAME.CAL master file
                before saving it.
OUTPUT (D:)     File NAME.PRN which must be copied to C:\NAME.  Make sure
                you check it visually before you save it.
-------------------------------------------------------------------------
COMMAND         MAKEPRN NAME
-------------------------------------------------------------------------
```

```
:MAKEPRN
ECHO OFF
CLS
ECHO                Program to write SC5 equation macro
ECHO ---------------------------------------------------------------------
ECHO MAKEPRN        Program to MAKE a PRN file from the master model file NAME
ECHO                for use in CREATE and other SWOPSIM programs
ECHO REQUIREMENTS   Model NAME master file must be on C:\NAME subdirectory.
ECHO                You MUST set the correct range in the NAME.CAL master file
ECHO                before saving it.
ECHO OUTPUT (D:)    File NAME.PRN which must be copied to C:\NAME.  Make sure
ECHO                you check it visually before you save it.
ECHO ---------------------------------------------------------------------
ECHO COMMAND        MAKEPRN NAME
ECHO ---------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: MAKEPRN NAME
IF FILE%1 == FILE GOTO END
IF EXIST C:\%1\%1.CAL GOTO C1
ECHO ERROR = %1.CAL master model file does not exist on C:\%1 subdirectory.
GOTO END
:C1
COPY C:\%1\%1.CAL D:
ECHO {MACRO}{PANELOFF}{STATUS "Creating %1.PRN file for model %1..."}
>D:TEST.XQT
ECHO /LD:%1~A~ >>D:TEST.XQT
ECHO /OF~OLP200~QQQ >>D:TEST.XQT
ECHO /FCA~4~/OF~OBNQLL4~T2~QQR~GQ~ >>D:TEST.XQT
ECHO {BEEP} >>D:TEST.XQT
ECHO /Q,Y~ >>D:TEST.XQT
CALL SC D:TEST
ERASE D:TEST.XQT
CLS
ECHO Remember to copy the file below from D: to C:\%1
TYPE D:%1.PRN
:END ECHO ON
```

The MAKEPRN program should be used to avoid problems with getting the right size print file from a master model file.

```
            SWOPSIM Program
-------------------------------------------------------------------------
CREATE      Program to create all the template SWOPSIM country/region
            files for the model NAME from a master file.  Each file,
            NAMEbCD.CAL (CD = country CoDe) must be saved to the
            C:\NAME subdirectory.  Then elasticities, model parameters,
            base data, and support price wedges must be correctly
            entered into each file before the equations are written
            with the program EQUATION.  The program also creates a
            batch file, NAMELOOP.BAT which must be saved in the
            C:\BATCH subdirectory.  This file allows automatic
            execution of SWOPSIM programs for all countries in NAME.
REQUIREMENTS A C:\NAME subdirectory must contain the master model
            file NAME.CAL and its ASCII version, NAME.PRN.  The C:
            directory should contain the file INOUT.TXT,
            the SuperCalc 5 spreadsheet (on a C: subdirectory) with a
            SC.BAT calling file, BASRUN programs, and SWOPSIM
            correctly installed.
OUTPUT (D:) NAMEbCD.CAL file for each country/region (with CoDe CD)
            in the model NAME and a NAMELOOP.BAT file.
-------------------------------------------------------------------------
COMMAND     CREATE NAME
-------------------------------------------------------------------------
```

```
:CREATE
ECHO OFF
CLS
ECHO             SWOPSIM Program
ECHO -------------------------------------------------------------------
ECHO CREATE      Program to create all the template SWOPSIM country/region
ECHO             files for the model NAME from a master file.  Each file,
ECHO             NAMEbCD.CAL (CD = country CoDe) must be saved to the
ECHO             C:\NAME subdirectory.  Then elasticities, model parameters,
ECHO             base data, and support price wedges must be correctly
ECHO             entered into each file before the equations are written
ECHO             with the program EQUATION.  The program also creates a
ECHO             batch file, NAMELOOP.BAT which must be saved in the
ECHO             C:\BATCH subdirectory.  This file allows automatic
ECHO             execution of SWOPSIM programs for all countries in NAME.
ECHO REQUIREMENTS A C:\NAME subdirectory must contain the master model
ECHO             file NAME.CAL and its ASCII version, NAME.PRN.  The C:
ECHO             directory should contain the file INOUT.TXT,
ECHO             the SuperCalc 5 spreadsheet (on a C: subdirectory) with a
ECHO             SC.BAT calling file, BASRUN programs, and SWOPSIM
ECHO             correctly installed.
ECHO OUTPUT (D:) NAMEbCD.CAL file for each country/region (with CoDe CD)
ECHO             in the model NAME and a NAMELOOP.BAT file.
ECHO -------------------------------------------------------------------
ECHO COMMAND     CREATE NAME
ECHO -------------------------------------------------------------------
IF FILE%1 == FILE  ECHO ERROR = You forgot model NAME; Enter: CREATE NAME
IF FILE%1 == FILE  GOTO END
IF EXIST C:\%1\%1.CAL GOTO C1
ECHO C:\%1\%1.CAL does not exist
GOTO END
:C1
COPY C:\%1\%1.CAL D:
IF EXIST C:\%1\%1.PRN GOTO C2
ECHO C:\%1\%1.PRN does not exist
GOTO END
:C2
COPY C:\%1\%1.PRN D:
IF EXIST D:%1b??.* ERASE D:%1b??.*
ECHO %1, >D:CREATE.TXT
C:\SWOPSIM\CREATE
ERASE D:CREATE.TXT
D:LOAD
:END ECHO ON
```

```
10 REM - CREATE - CREATE COUNTRY/REGION SPREADSHEETS FROM MASTER FILE SPECS.
20 CLS 'XQT FILE IS CREATED FOR EACH COUNTRY/REGION IN MASTER FILE
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FILE
40 WSQ$="~"
50 PRINT"Program to create new blank country/region spreadsheets from master"
60 PRINT"file (spreadsheet).  The new spreadsheets will be empty -  "
70 PRINT"elasticities and base data must be added to the new spreadsheets in"
80 PRINT"order to create constants and equations with the 'EQUATION'"
90 PRINT"program.  Master '.CAL' AND '.PRN' files must be on a subdirectory."
100 PRINT
110 PRINT"Be sure to answer all questions with CAPITAL LETTERS!":PRINT
120 OFILE$=XO$+"CREATE.TXT"
130 OPEN"I",1,OFILE$:INPUT #1,FILE$,CYY$:CLOSE 1 'READ MODEL AND COUNTRY CODE
140 NAM$=FILE$+"b"
150 PRINT:PRINT"Reading master file - ";XI$;FILE$;".PRN":PRINT
160 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 250 PRODUCTS
170 DIM NTRD(123) 'VECTOR FOR NON TRADED PRODUCTS (1 = TRADED, 0 = NON TRADED)
180 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
190 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
200 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
210 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
220 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
230 LCL=LEN(CL$)/2
240 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
250 FOR I=1 TO LCL
260 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
270 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
280 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
290 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
300 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
310 LCLL=LEN(CL$)/2
320 FOR I=1 TO LCLL
330 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
340 CL$=""
350 OFILE$=XO$+FILE$+".PRN"
```

```
360 OPEN"I",1,OFILE$
370 DIM D(123,42)
380 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
390 LINE INPUT #1,W$
400 LINE INPUT #1,W$
410 LINE INPUT #1,W$
420 LINE INPUT #1,CY$
430 LINE INPUT #1,W$
440 STAR=(INSTR(CY$,"-")-11)/3
450 LCY=(LEN(CY$)-8)/3
460 IF STAR < LCY THEN LCY=STAR
470 PRINT:PRINT"Countries/regions are:":PRINT
480 FOR I=1 TO LCY
490 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
500 LPR=0
510 PRINT:PRINT"Product groups are:":PRINT
520 LPR=LPR+1
530 LINE INPUT#1,W$
540 IF MID$(W$,LCY*3+16,2) = "NT" THEN NTRD(LPR)=0 ELSE NTRD(LPR)=1
550 WP$=MID$(W$,5,4)
560 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 580
570 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 560
580 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 660 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
590 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
600 X$=MID$(W$,(J-1)*3+9,3)
610 IF X$="  D" THEN X$="  2"
620 IF X$="  S" THEN X$="  3"
630 IF X$=" SD" OR X$=" DS" THEN X$="  4"
640 D(LPR,J)=VAL(X$):NEXT J
650 GOTO 520
660 CLOSE 1
670 PRINT:PRINT:INPUT"Do you want symmetry formulas in matrices [Y (default) or
N]";W$
680 IF LEFT$(W$,1)="N" THEN SYMTRY=0 ELSE SYMTRY=1
690 OFILE$=XO$+"LOAD.BAT"
700 OPEN"O",1,OFILE$
710 FOR I=1 TO LCY
720 W$="CALL "+XR$+"SC "+XO$+CYM$(0,I):GOSUB 4800
730 W$="ERASE "+XO$+CYM$(0,I)+".XQT":GOSUB 4800
740 NEXT I
750 W$="ERASE "+XO$+FILE$+".CAL":GOSUB 4800
760 W$="ERASE "+XO$+FILE$+".PRN":GOSUB 4800
770 W$="CLS":GOSUB 4800
780 W$="DIR "+XO$+"/W":GOSUB 4800
790 W$="ECHO ON":GOSUB 4800
800 CLOSE 1
810 PRINT:PRINT
820 LPR=LPR-1
830 PRINT:PRINT"Non-traded products are:  ";:FOR I=1 TO LPR:IF NTRD(I)=0 THEN
PRINT PRM$(0,I);" ";
840 NEXT I:PRINT
850 CLS:PRINT:PRINT"Writing 'XQT' macro program to create model spreadsheets
.....":PRINT
860 GOSUB 2500
870 FOR K=1 TO LCY 'MAJOR LOOP TO CREATE FILE FOR EACH COUNTRY/REGION
880 FOR I=1 TO LPR 'CHECK WHETHER ANY PRODUCT IS INCLUDED FOR COUNTRY/REGION
890 IF D(I,K)>0 THEN 920
900 NEXT I
910 GOTO 4390 'IF NO PRODUCT, THEN SKIP COUNTRY/REGION
920 OFILE$=XO$+CYM$(0,K)+".XQT"
930 OPEN"O",1,OFILE$
940 W$="{MACRO}":PRINT #1,W$
950 W$="{STATUS "+CHR$(34)+"Creating country model spreadsheet:
"+FILE$+"b"+CYM$(0,K)+CHR$(34)+"}"
960 GOSUB 4770
970 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 4770
980 W$="{WINDOWSOFF}":GOSUB 4770
990 W$="{PANELOFF}":GOSUB 4770
1000 REM BEGIN WRITING SUPERCALC COMMANDS TO XQT FILE
1010 W$="/GM":GOSUB 4700
1020 W$="/FCA,TR":GOSUB 4700
1030 W$="=A1":GOSUB 4700
1040 W$=CHR$(34)+NAM$+CYM$(0,K):GOSUB 4700:GOSUB 4820
1050 W$="/L"+XO$+FILE$+",PAQ1:AQ1,B1,V":GOSUB 4700
1060 W$="=C1":GOSUB 4700
1070 W$=CHR$(34)+"  XRATE-(LC/US$)->":GOSUB 4720:GOSUB 4820
1080 W$="=E1":GOSUB 4700
1090 W$="1":GOSUB 4700
1100 W$="=F1":GOSUB 4700
1110 W$="TODAY":GOSUB 4700:GOSUB 4820
1120 W$="=H1":GOSUB 4700
1130 W$=CHR$(34)+"TRANSMISS.-ELAS.->":GOSUB 4700:GOSUB 4820
1140 W$="=J1":GOSUB 4700
1150 W$="1":GOSUB 4700
1160 W$="=L1":GOSUB 4700
1170 W$="INCGROW->":GOSUB 4700:GOSUB 4820
1180 W$="=R1":GOSUB 4700
1190 W$=CHR$(34)+"  INCOME (M.US$)->":GOSUB 4720:GOSUB 4820
1200 W$="=M1":GOSUB 4700:W$="0":GOSUB 4700
1210 W$="=T1":GOSUB 4700:W$="0":GOSUB 4700
1220 W$="=O1":GOSUB 4700
1230 W$="POPGROW->":GOSUB 4700:GOSUB 4820
1240 W$="=V1":GOSUB 4700
1250 W$=CHR$(34)+"  POPUL. (1000)-->":GOSUB 4720:GOSUB 4820
1260 W$="=P1":GOSUB 4700:W$="0":GOSUB 4700
1270 W$="=X1":GOSUB 4700:W$="0":GOSUB 4700
1280 W$="=R2":GOSUB 4700
1290 W$="A SWOPSIM model courtesy of Vernon Oley Roningen":GOSUB 4720
1300 W$="/FER2,TL":GOSUB 4700:GOSUB 4820
1310 W$="=A3":GOSUB 4700
1320 W$=CHR$(34)+"SUPPLY-EL":GOSUB 4700:GOSUB 4820
1330 W$="/FR3,TR":GOSUB 4700
```

```
1340 FOR I=1 TO LPR:IF D(I,K)=0 THEN 1370 'WRITE SUPPLY ELAST. MATRIX COL. HEADS
1350 W$="="+CLM$(0,I+1)+"3":GOSUB 4700
1360 W$=CHR$(34)+PRM$(0,I):GOSUB 4700:GOSUB 4820
1370 NEXT I
1380 LG=0
1390 FOR I=1 TO LPR:IF D(I,LCY)=3 OR D(I,LCY)=4 THEN 1400 ELSE 1430 'D. VAR. TO
S.
1400 LG=LG+1:W$="="+CLM$(0,LPR+1+LG)+"3":GOSUB 4700
1410 IF D(I,K)=3 OR D(I,K)=4 THEN 1420 ELSE 1430
1420 W$=CHR$(34)+"D"+PRM$(0,I):GOSUB 4700:GOSUB 4820
1430 NEXT I
1440 LGS=LG+1 'WRITE SUPPLY ROW SUM HEAD
1450 W$="="+CLM$(0,LPR+1+LGS)+"3":GOSUB 4700
1460 W$=CHR$(34)+"SUPSUM":GOSUB 4700:GOSUB 4820
1470 W$="="+CLM$(0,LPR+2+LGS)+"3":GOSUB 4700
1480 W$=CHR$(34)+"S-D SUM":GOSUB 4700:GOSUB 4820
1490 FOR I=1 TO LPR 'WRITE SUPPLY ELASTICITY ROW
1500 IF D(I,K)=0 THEN 1660
1510 W$="=A"+STR$(I+3):GOSUB 4700
1520 W$=CHR$(34)+PRM$(0,I):GOSUB 4700:GOSUB 4820
1530 FOR J=1 TO LPR 'WRITE COLUMN OF ZERO ELASTICITIES FOR SUPPLY MATRIX ROW
1540 IF D(J,K)=0 THEN 1630
1550 W$="="+CLM$(0,J+1)+STR$(I+3):GOSUB 4700
1560 IF SYMTRY=1 AND I>J THEN GOTO 1600 'ADD SYMMETRY FORMULAS FOR SUPPLY
1570 W$="0":GOSUB 4700
1580 W$="/FE"+CLM$(0,J+1)+STR$(I+3)+",$":GOSUB 4700
1590 GOTO 1630
1600 W$="C"+STR$(J+2*LPR+8)+"*"+CLM$(0,I+1)+STR$(J+3)+"*G"+STR$(J+2*LPR+8)
1610 W$=W$+"/(C"+STR$(I+2*LPR+8)+"*G"+STR$(I+2*LPR+8)+")":GOSUB 4700
1620 W$="/FE"+CLM$(0,J+1)+STR$(I+3)+",$":GOSUB 4700:GOSUB 4820
1630 NEXT J
1640 W$="="+CLM$(0,LPR+1+LGS)+STR$(I+3):GOSUB 4700 'WRITE SUPPLY ROW SUMS
1650 W$="SUM(B"+STR$(I+3)+":"+CLM$(0,LPR+1)+STR$(I+3)+")":GOSUB 4700:GOSUB
4780:GOSUB 4820
1660 NEXT I
1670 W$="=A"+STR$(LPR+5):GOSUB 4700
1680 W$=CHR$(34)+"DEMAND-EL":GOSUB 4700:GOSUB 4820
1690 W$="/FR"+STR$(LPR+5)+",TR":GOSUB 4700
1700 FOR I=1 TO LPR:IF D(I,K)=0 THEN 1730 'WRITE DEM. ELAST. MATRIX COL. HEADS
1710 W$="="+CLM$(0,I+1)+STR$(LPR+5):GOSUB 4700
1720 W$=CHR$(34)+PRM$(0,I):GOSUB 4700:GOSUB 4820
1730 NEXT I
1740 LF=0
1750 FOR I=1 TO LPR:IF D(I,LCY)=2 OR D(I,LCY)=4 THEN 1760 ELSE 1790 'S. VAR. TO
D.
1760 LF=LF+1:W$="="+CLM$(0,LPR+1+LF)+STR$(LPR+5):GOSUB 4700
1770 IF D(I,K)=2 OR D(I,K)=4 THEN 1780 ELSE 1790
1780 W$=CHR$(34)+"S"+PRM$(0,I):GOSUB 4700:GOSUB 4820
1790 NEXT I
1800 LFS=LF+1 'WRITE DEMAND ROW SUM HEAD
1810 W$="="+CLM$(0,LPR+1+LFS)+STR$(LPR+5):GOSUB 4700
1820 W$=CHR$(34)+"DEMSUM":GOSUB 4700:GOSUB 4820
1830 FOR I=1 TO LPR 'WRITE DEMAND ELASTICITY ROW
1840 IF D(I,K)=0 THEN 2020
1850 W$="=A"+STR$(I+LPR+5):GOSUB 4700
1860 W$=CHR$(34)+PRM$(0,I):GOSUB 4700:GOSUB 4820
1870 FOR J=1 TO LPR 'WRITE COLUMN OF ZERO ELASTICITIES FOR DEMAND MATRIX ROW
1880 IF D(J,K)=0 THEN 1970
1890 W$="="+CLM$(0,J+1)+STR$(I+LPR+5):GOSUB 4700
1900 IF SYMTRY=1 AND I>J THEN GOTO 1940 'ADD SYMMETRY FORMULAS FOR DEMAND
1910 W$="0":GOSUB 4700
1920 W$="/FE"+CLM$(0,J+1)+STR$(I+LPR+5)+",$":GOSUB 4700
1930 GOTO 1970
1940 W$="D"+STR$(J+2*LPR+8)+"*"+CLM$(0,I+1)+STR$(J+LPR+5)+"*H"+STR$(J+2*LPR+8)
1950 W$=W$+"/(D"+STR$(I+2*LPR+8)+"*H"+STR$(I+2*LPR+8)+")":GOSUB 4700
1960 W$="/FE"+CLM$(0,J+1)+STR$(I+LPR+5)+",$":GOSUB 4700:GOSUB 4820
1970 NEXT J
1980 W$="="+CLM$(0,LPR+1+LFS)+STR$(I+LPR+5):GOSUB 4700 'WRITE DEMAND ROW SUMS
1990 W$="SUM(B"+STR$(I+LPR+5)+":"+CLM$(0,LPR+1)+STR$(I+LPR+5)+")":GOSUB
4700:GOSUB 4780:GOSUB 4820
2000 W$="="+CLM$(0,LPR+2+LGS)+STR$(I+3):GOSUB 4700
2010 W$=CLM$(0,LPR+1+LGS)+STR$(I+3)+"-"+CLM$(0,LPR+1+LFS)+STR$(I+LPR+5):GOSUB
4700:GOSUB 4780:GOSUB 4820
2020 NEXT I
2030 IB=1:IHEAD=0:IE=1 'WRITE ARMINGTON MODEL DATA
2040 IF IB>LPR THEN 2370
2050 IE=IE+1:IF IE>LPR THEN 2070
2060 IF RIGHT$(PRM$(0,IB),2)=RIGHT$(PRM$(0,IE),2) THEN 2050
2070 IE=IE-1:IF IE=IB OR D(IB,K)=0 THEN 2360
2080 IHEAD=1:W$="="+CLM$(0,LPR+6+LFS)+STR$(IB+LPR+5):GOSUB 4700
2090 W$="0" 'VDSUM LOOP
2100 FOR I3=IB TO IE
2110 W$=W$+"+D"+STR$(I3+2*LPR+8)+"*H"+STR$(I3+2*LPR+8)
2120 NEXT I3
2130 GOSUB 4700
2140 W$="/FE"+CLM$(0,LPR+6+LFS)+STR$(IB+LPR+5)+",G":GOSUB 4700:GOSUB 4820
2150 FOR IJ=IB TO IE
2160 W$="="+CLM$(0,LPR+7+LFS)+STR$(IJ+LPR+5):GOSUB 4700
2170
W$="D"+STR$(IJ+2*LPR+8)+"*H"+STR$(IJ+2*LPR+8)+"/"+CLM$(0,LPR+6+LFS)+STR$(IB+LPR+
5):GOSUB 4700 'SHARE OF DEMAND VALUE
2180 W$="/FE"+CLM$(0,LPR+7+LFS)+STR$(IJ+LPR+5)+",$":GOSUB 4700:GOSUB 4820
2190 NEXT IJ
2200 W$="="+CLM$(0,LPR+8+LFS)+STR$(IB+LPR+5):GOSUB 4700
2210 W$="-.5":GOSUB 4700 'OWN PRICE ELASTICITY OF DEMAND
2220 FOR I3=IB TO IE
2230 W$="="+CLM$(0,LPR+9+LFS)+STR$(I3+LPR+5):GOSUB 4700
2240 W$="3":GOSUB 4700 'ELASTICITY OF SUBSTITUTION
2250 NEXT I3
2260 FOR IJC=IB TO IE
2270 FOR IJR=IB TO IE
2280 W$="="+CLM$(0,IJC+1)+STR$(IJR+LPR+5):GOSUB 4700
2290 IF IJC=IJR THEN 2300 ELSE 2340
2300 W$="-(1-"+CLM$(0,LPR+7+LFS)+STR$(IJR+LPR+5)+")*"+CLM$(0,LPR+9+LFS)
```

```
2310 W$=W$+STR$(IJR+LPR+5)+"+"+CLM$(0,LPR+7+LFS)+STR$(IJR+LPR+5)+"*"
2320 W$=W$+CLM$(0,LPR+8+LFS)+STR$(IB+LPR+5):GOSUB 4700:GOSUB 4820
2330 GOTO 2350
2340
W$=CLM$(0,LPR+7+LFS)+STR$(IJC+LPR+5)+"*("+CLM$(0,LPR+9+LFS)+STR$(IJR+LPR+5)+"+"+
CLM$(0,LPR+8+LFS)+STR$(IB+LPR+5)+")":GOSUB 4700:GOSUB 4820
2350 NEXT IJR:NEXT IJC
2360 IB=IE+1:IE=IB:GOTO 2040
2370 IF IHEAD=0 THEN 2460 'WRITE ARMINGTON DATA HEAD IF ARMINGTON SPEC. USED
2380 W$="="+CLM$(0,LPR+6+LFS)+STR$(LPR+5):GOSUB 4700
2390 W$=CHR$(34)+"VDSUM":GOSUB 4700:GOSUB 4820
2400 W$="="+CLM$(0,LPR+7+LFS)+STR$(LPR+5):GOSUB 4700
2410 W$=CHR$(34)+"DSHARE":GOSUB 4700:GOSUB 4820
2420 W$="="+CLM$(0,LPR+8+LFS)+STR$(LPR+5):GOSUB 4700
2430 W$=CHR$(34)+"OWN PR.":GOSUB 4700:GOSUB 4820
2440 W$="="+CLM$(0,LPR+9+LFS)+STR$(LPR+5):GOSUB 4700
2450 W$=CHR$(34)+"ELASUBS":GOSUB 4700:GOSUB 4820
2460 W$="=A"+STR$(2*LPR+8):GOSUB 4700:GOSUB 4820 'BEGIN TO WRITE DATA PART OF
SPREADSHEET
2470 W$=CHR$(34)+NAM$+CYM$(0,K):GOSUB 4700:GOSUB 4820
2480 W$="/FR"+STR$(2*LPR+8)+",TR":GOSUB 4700
2490 GOTO 3500
2500 DIM N$(0,99) 'SUBROUTINE TO CREATE DATA COLUMN HEADS
2510 N$(0,1)="WDPRICE"   'B
2520 N$(0,2)="PRPRICE"   'C
2530 N$(0,3)="CNPRICE"   'D
2540 N$(0,4)="TDPRICE"   'E
2550 N$(0,5)="XRATE"     'F
2560 N$(0,6)="SUPPLY"    'G
2570 N$(0,7)="DEMAND"    'H
2580 N$(0,8)="NTRADE"    'I
2590 N$(0,9)="CTRAN.EL"  'J
2600 N$(0,10)="WDPT.EL"  'K
2610 N$(0,11)="SSHIFT"   'L
2620 N$(0,12)="DSHIFT"   'M
2630 N$(0,13)="PRSUBW"   'N
2640 N$(0,14)="CNSUBW"   'O
2650 N$(0,15)="IMSUBW"   'P
2660 N$(0,16)="EXSUBW"   'Q
2670 N$(0,17)="SCROSSO"  'R
2680 N$(0,18)="DCROSSO"  'S
2690 N$(0,19)="TDCONST"  'T
2700 N$(0,20)="PRCONST"  'U
2710 N$(0,21)="CNCONST"  'V
2720 N$(0,22)="LPRPRICE" 'W
2730 N$(0,23)="LCNPRICE" 'X
2740 N$(0,24)="SCROSS"   'Y
2750 N$(0,25)="DCROSS"   'Z
2760 N$(0,26)="SCONST"   'AA
2770 N$(0,27)="DCONST"   'AB
2780 N$(0,28)="SUPPLYEQ" 'AC
2790 N$(0,29)="DEMANDEQ" 'AD
2800 N$(0,30)="NTRADEEQ" 'AE
2810 N$(0,31)="TRADEOQ"  'AF
2820 N$(0,32)="SUPGROW"  'AG
2830 N$(0,33)="INCELAS"  'AH
2840 N$(0,34)="PTELAS"   'AI
2850 N$(0,35)="DPSW"     'AJ
2860 N$(0,36)="CSW"      'AK
2870 N$(0,37)="MSW"      'AL
2880 N$(0,38)="ESW"      'AM
2890 N$(0,39)="NTSSHIFT" 'AN
2900 N$(0,40)="SUPPLYD"  'AO
2910 N$(0,41)="DEMANDD"  'AP
2920 N$(0,42)="NTRADED"  'AQ
2930 N$(0,43)="PRPRICED" 'AR
2940 N$(0,44)="CNPRICED" 'AS
2950 N$(0,45)="TDPRICE%" 'AT
2960 N$(0,46)="SUPPLY%"  'AU
2970 N$(0,47)="PRPRICE%" 'AV
2980 N$(0,48)="DEMAND%"  'AW
2990 N$(0,49)="CNPRICE%" 'AX
3000 N$(0,50)="NTRADE%"  'AY
3010 N$(0,51)="PBSE"     'AZ
3020 N$(0,52)="CBSE"     'BA
3030 N$(0,53)="PSURPLUS" 'BB
3040 N$(0,54)="CSURPLUS" 'BC
3050 N$(0,55)="GDPVAL"   'BD
3060 N$(0,56)="FARMVAL"  'BE
3070 N$(0,57)="GOVTEXPD" 'BF
3080 N$(0,58)="NEWGEXPD" 'BG
3090 N$(0,59)="WELFARE"  'BH
3100 N$(0,60)="MKPRICE"  'BI
3110 N$(0,61)="CQRENT"   'BJ
3120 N$(0,62)="PTAXE"    'BK
3130 N$(0,63)="MPSURPLS" 'BL
3140 N$(0,64)="LSHRPSW"  'BM
3150 N$(0,65)="LSHRCSW"  'BN
3160 N$(0,66)="LSHRMSW"  'BO
3170 N$(0,67)="LSHRESW"  'BP
3180 N$(0,68)="BGREXP"   'BQ
3190 N$(0,69)="BGRIMP"   'BR
3200 N$(0,70)="LGREXP"   'BS
3210 N$(0,71)="LGRIMP"   'BT
3220 N$(0,72)="BWDPRICE" 'BU
3230 N$(0,73)="BNTRADEV" 'BV
3240 N$(0,74)="LNTRADEV" 'BW
3250 N$(0,75)="NTRADEVD" 'BX
3260 N$(0,76)="BSELFSFR" 'BY
3270 N$(0,77)="LSELFSFR" 'BZ
3280 N$(0,78)="MBSE"     'CA
3290 N$(0,79)="EBSE"     'CB
3300 N$(0,80)="GREXPD"   'CC
3310 N$(0,81)="GRIMPD"   'CD
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3320 N$(0,82)="GREXP%"   'CE
3330 N$(0,83)="GRIMP%"   'CF
3340 N$(0,84)="BQRENT"   'CG
3350 N$(0,85)="BDEMPC"   'CH
3360 N$(0,86)="LDEMPC"   'CI
3370 N$(0,87)="BPVALUE"  'CJ
3380 N$(0,88)="PSUPPRT"  'CK
3390 N$(0,89)="PROJADJ"  'CL
3400 N$(0,90)="......."  'CM
3410 N$(0,91)="SHNFED"   'CN
3420 N$(0,92)="SHCONS"   'CO
3430 N$(0,93)="......."  'CP
3440 N$(0,94)="EXTREVC"  'CQ
3450 N$(0,95)="SETSIDE"  'CR
3460 N$(0,96)="PPRMAT"   'CS
3470 N$(0,97)="MKSUPRT"  'CT
3480 N$(0,98)="BCVALUE"  'CU
3490 RETURN
3500 FOR I=1 TO 98 'WRITE DATA COLUMN HEADS ON SPREADSHEET
3510 W$="="+CLM$(0,I+1)+STR$(2*LPR+8):GOSUB 4700
3520 W$=CHR$(34)+N$(0,I):GOSUB 4700:GOSUB 4820
3530 NEXT I
3540 FOR I=1 TO LPR 'LOOP TO WRITE DATA COLUMN FOR EACH PRODUCT GROUP
3550 IF D(I,K)=0 THEN 4250 'SKIP ROW IF PRODUCT NOT INCLUDED FOR COUNTRY
3560 S$=RIGHT$(STR$(I+2*LPR+8),LEN(STR$(I+2*LPR+8))-1) 'SELECT ROW
3570 W$="=A"+S$:GOSUB 4700
3580 W$=CHR$(34)+PRM$(0,I):GOSUB 4700:GOSUB 4820
3590 T$=STR$(I+4)
3600 W$="=B"+S$:GOSUB 4700 'LOAD WDPRICE FROM MASTER FILE
3610 W$="/L"+XO$+FILE$+",PAR"+T$+":AR"+T$+",B"+S$+",V":GOSUB 4700:GOSUB 4820
3620 W$="=C"+S$:GOSUB 4700 'WRITE ZERO WHERE DATA IS TO BE ENTERED
3630 W$="0":GOSUB 4700
3640 W$="=D"+S$:GOSUB 4700 'WRITE ZERO WHERE DATA IS TO BE ENTERED
3650 W$="0":GOSUB 4700
3660 W$="=E"+S$:GOSUB 4700 'WRITE ZERO WHERE DATA IS TO BE ENTERED
3670 W$="0":GOSUB 4700
3680 W$="=F"+S$:GOSUB 4700 'XRATE FROM TOP OF SHEET
3690 W$="E1":GOSUB 4700:GOSUB 4820
3700 W$="=G"+S$:GOSUB 4700 'PUT ZERO WHERE DATA IS TO BE ENTERED
3710 W$="0":GOSUB 4700
3720 W$="=H"+S$:GOSUB 4700 'PUT ZERO WHERE DATA IS TO BE ENTERED
3730 W$="0":GOSUB 4700
3740 W$="=I"+S$:GOSUB 4700 'NET TRADE
3750 W$="G"+S$+"-H"+S$:GOSUB 4700:GOSUB 4820
3760 W$="=J"+S$:GOSUB 4700 'XRATE EL FROM TOP OF SHEET
3770 W$="J1":GOSUB 4700:GOSUB 4820
3780 W$="=K"+S$:GOSUB 4700 'SET WORLD PRICE TRANSMISSION ELASTICITY TO 1
3790 W$="1":GOSUB 4700
3800 W$="=L"+S$:GOSUB 4700 'COLUMN FOR SUPPLY SHIFT%
3810 W$="0":GOSUB 4700:GOSUB 4780:GOSUB 4820
3820 W$="=M"+S$:GOSUB 4700 'COLUMN FOR DEMAND SHIFT%
3830 W$="0":GOSUB 4700:GOSUB 4780:GOSUB 4820
3840 W$="=T"+S$:GOSUB 4700 'TRADE PRICE CONSTANT
3850 W$="E"+S$+"/((F"+S$+"*B"+S$+")^(J"+S$+"*K"+S$+"))":GOSUB 4700:GOSUB 4820
3860 W$="=U"+S$:GOSUB 4700 'PRODUCER PRICE CONSTANT
3870 W$="C"+S$+"-E"+S$:GOSUB 4700:GOSUB 4820
3880 W$="=V"+S$:GOSUB 4700 'CONSUMER PRICE CONSTANT
3890 W$="D"+S$+"-C"+S$:GOSUB 4700:GOSUB 4820
3900 W$="=W"+S$:GOSUB 4700 'LIBERALIZED PRODUCER PRICE
3910 W$="MAX(U"+S$+"-N"+S$+"+P"+S$
3920 W$=W$+"-Q"+S$+"+T"+S$+"*(F"+S$
3930 W$=W$+"*B"+S$+")^(J"+S$+"*K"+S$+"),1)"
3940 W$=W$+"+AF"+S$ ' ALLOW FOR NON-TRADED OR POLICY PRICE ADJUSTMENTS
3950 GOSUB 4700:GOSUB 4820
3960 W$="=X"+S$:GOSUB 4700 'LIBERALIZED CONSUMER PRICE
3970 W$="MAX(W"+S$+"+N"+S$+"+O"+S$+"+V"+S$+",1)":GOSUB 4700:GOSUB 4820
3980 W$="=AE"+S$:GOSUB 4700 'NET TRADE EQUATION
3990 W$="AC"+S$+"-AD"+S$:GOSUB 4700:GOSUB 4820
4000 IF NTRD(I)=1 THEN 4030
4010 W$="=AF"+S$:GOSUB 4700 'MARKET CLEARING MECHANISM FOR NON-TRADED PRODUCT
4020 W$="IF(ITER=1,0,AF"+S$+"-(W"+S$+"*(AE"+S$+")/AC"+S$+"))":GOSUB 4700:GOSUB
4820
4030 W$="=AO"+S$:GOSUB 4700 'SUPPLY DIFFERENCE
4040 W$="AC"+S$+"-G"+S$:GOSUB 4700:GOSUB 4790:GOSUB 4820
4050 W$="=AP"+S$:GOSUB 4700 'DEMAND DIFFERENCE
4060 W$="AD"+S$+"-H"+S$:GOSUB 4700:GOSUB 4790:GOSUB 4820
4070 W$="=AQ"+S$:GOSUB 4700 'NET TRADE DIFFERENCE
4080 W$="AE"+S$+"-I"+S$:GOSUB 4700:GOSUB 4790:GOSUB 4820
4090 W$="=AR"+S$:GOSUB 4700 'PRODUCER PRICE DIFFERENCE
4100 W$="W"+S$+"-C"+S$:GOSUB 4700:GOSUB 4820
4110 W$="=AS"+S$:GOSUB 4700 'CONSUMER PRICE DIFFERENCE
4120 W$="X"+S$+"-D"+S$:GOSUB 4700:GOSUB 4820
4130 W$="=AT"+S$:GOSUB 4700 '% CHANGE IN TRADE PRICE
4140 W$="((T"+S$+"*(F"+S$+"*B"+S$+")^(J"+S$+"*K"+S$+"))-E"+S$+")*100/E"+S$:GOSUB
4700:GOSUB 4780:GOSUB 4820
4150 W$="=AU"+S$:GOSUB 4700 '% CHANGE IN SUPPLY
4160 W$="AO"+S$+"*100/(.0001+G"+S$+")":GOSUB 4700:GOSUB 4780:GOSUB 4820
4170 W$="=AV"+S$:GOSUB 4700 '% CHANGE IN PRODUCER PRICE
4180 W$="AR"+S$+"*100/C"+S$:GOSUB 4700:GOSUB 4780:GOSUB 4820
4190 W$="=AW"+S$:GOSUB 4700 '% CHANGE IN DEMAND
4200 W$="AP"+S$+"*100/(.0001+H"+S$+")":GOSUB 4700:GOSUB 4780:GOSUB 4820
4210 W$="=AX"+S$:GOSUB 4700 '% CHANGE IN CONSUMER PRICE
4220 W$="AS"+S$+"*100/D"+S$:GOSUB 4700:GOSUB 4780:GOSUB 4820
4230 W$="=AY"+S$:GOSUB 4700 '% CHANGE IN NET TRADE
4240 W$="AQ"+S$+"*100/(1+I"+S$+")":GOSUB 4700:GOSUB 4780:GOSUB 4820
4250 NEXT I
4260 WW$="C1":GOSUB 4830 'FORMAT A CELL LEFT JUSTIFIED
4270 WW$="H1":GOSUB 4830
4280 WW$="L1":GOSUB 4830
4290 WW$="O1":GOSUB 4830
4300 WW$="R1":GOSUB 4830
4310 WW$="V1":GOSUB 4830
4320 W$="/FG,TR":GOSUB 4700
4330 W$="=A1":GOSUB 4700
```

```
4340 W$="!":GOSUB 4700
4350 W$="/S"+XO$+NAM$+CYM$(0,K)+",A":GOSUB 4700 'SAVE THE SPREADSHEET
4360 IF K=LCY THEN W$="{BEEP 2}":GOSUB 4770
4370 W$="/Q,Y":GOSUB 4700
4380 CLOSE 1
4390 NEXT K 'END OF LOOP FOR EACH COUNTRY/REGION
4400 OFILE$=XO$+FILE$+"LOOP.BAT"
4410 OPEN"O",1,OFILE$
4420 W$=":"+FILE$+"LOOP":GOSUB 4800
4430 W$="ECHO OFF":GOSUB 4800:W$="CLS":GOSUB 4800
4440 W$="ECHO "+FILE$+"LOOP - A batch program to loop though the "+FILE$+"
country list":GOSUB 4800
4450 W$="ECHO            and call another batch program.":GOSUB 4800
4460 W$="ECHO --------":GOSUB 4800
4470 W$="ECHO INPUT      Batch program file name (PGNAME) called on batch":GOSUB
4800
4480 W$="ECHO            subdirectory and any other parameters required
for":GOSUB 4800
4490 W$="ECHO            the batch program.":GOSUB 4800
4500 W$="ECHO OUTPUT     Output of batch file called for each
country/region":GOSUB 4800
4510 W$="ECHO            in "+FILE$+".":GOSUB 4800
4520 W$="ECHO COMMAND    "+FILE$+"LOOP PGNAME (other parameters called in batch
program)":GOSUB 4800
4530 W$="ECHO --------":GOSUB 4800
4540 W$="IF FILE%1 == FILE ECHO ERROR = You forgot ProGram NAME; Enter:
"+FILE$+"LOOP PGNAME (other parameters?)":GOSUB 4800
4550 W$="IF FILE%1 == FILE GOTO END":GOSUB 4800
4560 W$="IF EXIST "+XR$+"\BATCH\%1.BAT GOTO C1":GOSUB 4800
4570 W$="ECHO "+XR$+"\BATCH\%1.BAT does not exist":GOSUB 4800
4580 W$="GOTO END":GOSUB 4800
4590 W$=":C1":GOSUB 4800
4600 FOR K1=1 TO LCY STEP 10
4610 IF K1+9>LCY THEN K2=LCY ELSE K2=K1+9
4620 W$="FOR %%C IN (":FOR K=K1 TO K2:W$=W$+CYM$(0,K)+" ":NEXT K
4630 W$=LEFT$(W$,LEN(W$)-1)+") DO CALL "+XR$+"\BATCH\%1 "+FILE$+" %%C %2 %3 %4
%5 %6":GOSUB 4800
4640 NEXT K1
4650 W$="DIR "+XO$+"/W":GOSUB 4800
4660 W$=":END ECHO ON":GOSUB 4800
4670 CLOSE 1
4680 SYSTEM
4690 END
4700 P0=INSTR(W$," "):IF P0=0 THEN 4720 'REMOVE SPACES FROM STRING
4710 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 4700
4720 IF LEFT$(W$,1)="/" THEN GOTO 4770
4730 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
4740 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
4750 IF W$="!" THEN PRINT #1,"{CALC}":RETURN
4760 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
4770 PRINT #1,W$;WSQ$:RETURN 'WRITE TO SHEET
4780 PRINT #1,"/FE";WW$;",$";WSQ$:RETURN 'PROTECT AND USE $ FORMAT
4790 PRINT #1,"/FE";WW$;",I";WSQ$:RETURN 'PROTECT AND USE INTEGER FORMAT
4800 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
4810 PRINT #1,"/U";WW$;WSQ$:RETURN 'UNPROTECT A CELL
4820 PRINT #1,"/P";WW$;WSQ$:RETURN 'PROTECT A CELL
4830 PRINT #1,"/U";WW$;WSQ$ 'UPROTECT, LEFT JUSTIFY, PROTECT
4840 PRINT #1,"/FE";WW$;",TL";WSQ$
4850 PRINT #1,"/P";WW$;WSQ$:RETURN
```

```
                SWOPSIM Program
-------------------------------------------------------------------------
CREATEWK        Program to create a master support spreadsheet for model
                NAME which contains formulas to calculate price wedges for
                SWOPSIM models from data on Producer and Consumer Subsidy
                Equivalents (PSEs and CSEs).  This master spreadsheet is
                used each time the program WORK is run to update a support
                spreadsheet for a country.
REQUIREMENTS    Model master NAME.PRN file must be on C:\NAME subdirectory.
OUTPUT (D:)     Master support spreadsheet NAMEWORK.CAL and SuperCalc 5
                macro program NAMETHIN.XQT which are used for WORK program.
-------------------------------------------------------------------------
COMMAND         CREATEWK NAME
-------------------------------------------------------------------------
```

```
:CREATEWK
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO -------------------------------------------------------------------------
ECHO CREATEWK       Program to create a master support spreadsheet for model
ECHO                NAME which contains formulas to calculate price wedges for
ECHO                SWOPSIM models from data on Producer and Consumer Subsidy
ECHO                Equivalents (PSEs and CSEs).  This master spreadsheet is
ECHO                used each time the program WORK is run to update a support
ECHO                spreadsheet for a country.
ECHO REQUIREMENTS   Model master NAME.PRN file must be on C:\NAME subdirectory.
ECHO OUTPUT (D:)    Master support spreadsheet NAMEWORK.CAL and SuperCalc 5
ECHO                macro program NAMETHIN.XQT which are used for WORK program.
ECHO -------------------------------------------------------------------------
ECHO COMMAND        CREATEWK NAME
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE   ECHO ERROR = You forgot model NAME; Enter: CREATEWK NAME
IF FILE%1 == FILE   GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:\%1 subdirectory
:C1
COPY C:\%1\%1.PRN D:
ECHO %1, >D:CREATEWK.TXT
IF EXIST D:%1WORK.CAL ERASE D:%1WORK.CAL
IF EXIST D:%1THIN.XQT ERASE D:%1THIN.XQT
C:\SWOPSIM\CREATEWK
CALL C:SC D:TEST
```

```
ERASE D:TEST.XQT
ERASE D:CREATEWK.TXT
ERASE D:%1.PRN
CLS
DIR D:%1*.*/W
:END ECHO ON

10 REM - CREATEWK CREATE MASTER SUPPORT WORKSHEET FOR A MODEL
20 CLS
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FILE
40 WSQ$="~"
50 PRINT"Program to create a master support worksheet for a model."
60 PRINT:PRINT"Program assumes master 'CAL' and 'PRN' files are on"
70 PRINT"a subdirectory of the same name as the master file":PRINT
80 OFILE$=XO$+"CREATEWK.TXT"
90 OPEN"I",1,OFILE$:INPUT #1,FILE$:CLOSE 1 'READ MODEL AND COUNTRY CODE
100 PRINT:PRINT"READING MASTER FILE - ";FILE$:PRINT
110 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN ABOUT UP TO 250 PRODUCT GROUPS
120 DIM PRMO(200) 'VECTOR OF CODES TO OMIT PRODUCT IN FORMULA GENERATION
130 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
140 DIM CYMO(42) 'VECTOR OF CODES TO OMIT COUNTRY/REGION FROM MODEL (0=OMIT)
150 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
160 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
170 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
180 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
190 LCL=LEN(CL$)/2
200 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
210 FOR I=1 TO LCL
220 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
230 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
240 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
250 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
260 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
270 LCLL=LEN(CL$)/2
280 FOR I=1 TO LCLL
290 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
300 CL$=""
310 OFILE$=XO$+FILE$+".PRN"
320 OPEN"I",1,OFILE$
330 DIM D(123,42)
340 LINE INPUT #1,W$ 'BEGIN READING MASTER PRN FILE
350 LINE INPUT #1,W$
360 LINE INPUT #1,W$
370 LINE INPUT #1,W$
380 LINE INPUT #1,CY$
390 LINE INPUT #1,W$
400 STAR=(INSTR(CY$,"-")-11)/3
410 LCY=(LEN(CY$)-8)/3
420 IF STAR < LCY THEN LCY=STAR
430 PRINT:PRINT"Countries/regions are:":PRINT
440 FOR I=1 TO LCY
450 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
460 LPR=0
470 PRINT:PRINT:PRINT"Product groups are:":PRINT
480 LPR=LPR+1
490 LINE INPUT#1,W$
500 WP$=MID$(W$,5,4)
510 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 530
520 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 510
530 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 610 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
540 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
550 X$=MID$(W$,(J-1)*3+9,3)
560 IF X$="  D" THEN X$="  2"
570 IF X$="  S" THEN X$="  3"
580 IF X$=" SD" OR X$=" DS" THEN X$="  4"
590 D(LPR,J)=VAL(X$):NEXT J
600 GOTO 480
610 CLOSE 1
620 LPR=LPR-1
630 PRINT:PRINT:PRINT
640 PRINT"Writing 'XQT' file to create support worksheet for ";FILE$;":":PRINT
650 OFILE$=XO$+"TEST.XQT"
660 OPEN"O",1,OFILE$
670 W$="{MACRO}":GOSUB 2250
680 REM W$="{WINDOWSOFF}":GOSUB 2130
690 W$="{PANELOFF}":GOSUB 2190
700 W$="{STATUS "+CHR$(34)+"Creating template for support worksheet:
"+FILE$+"WORK"+CHR$(34)+"}":GOSUB 2190
710 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2190
720 W$="/L"+XI$+"SWOPSIM\NAMEWORK,A":GOSUB 2130
730 W$="/BA6:CT6":GOSUB 2130
740 W$="/BA18:CT18":GOSUB 2130
750 W$="=A1":GOSUB 2130
760 P$="O1":GOSUB 2240:P$="AC1":GOSUB 2240
770 P$="AQ1":GOSUB 2240:P$="BE1":GOSUB 2240:P$="BS1":GOSUB 2240
780 P$="CG1":GOSUB 2240:P$="O13":GOSUB 2240
790 P$="A1":GOSUB 2240
800 IF LPR>2 THEN 810 ELSE 1820
810 REM REPLICATE THE BOTTOM HALF OF THE NAMETEMP SUPPORT WORKSHEET
820 W$="/IR20:"+STR$(19+LPR-2):GOSUB 2130
830 W$="/RA19:BD19,A20:A"+STR$(19+LPR-1):GOSUB 2130
840 W$="/IR8:"+STR$(7+LPR-2):GOSUB 2130
850 RB=19+LPR-2:GOSUB 2210
860 CB$="B":CE$="B":Y$="NYNYNYYNYNYNYNYYYY":GOSUB 2220
870 CB$="C":CE$="C":Y$="NYNYNYNYNYNYNYYYY":GOSUB 2220
880 CB$="D":CE$="D":Y$="YYYYYNYNYNYNYNYNYNY":GOSUB 2220
890 CB$="E":CE$="E":Y$="YYYYYNYNYNYNYNYNYNY":GOSUB 2220
900 CB$="F":CE$="F":Y$="YYYY":GOSUB 2220
910 CB$="K":CE$="K":Y$="YNY":GOSUB 2220
920 CB$="L":CE$="L":Y$="YNY":GOSUB 2220
930 CB$="M":CE$="M":Y$="YNY":GOSUB 2220
940 CB$="N":CE$="N":Y$="YNY":GOSUB 2220
```

```
950 CB$="R":CE$="R":Y$="YYYY":GOSUB 2220
960 CB$="S":CE$="S":Y$="YYYY":GOSUB 2220
970 CB$="V":CE$="V":Y$="YYYYNYYYY":GOSUB 2220
980 CB$="W":CE$="W":Y$="Y":GOSUB 2220
990 CB$="X":CE$="X":Y$="YY":GOSUB 2220
1000 CB$="Y":CE$="Y":Y$="YNY":GOSUB 2220
1010 CB$="AB":CE$="AB":Y$="YYYYYYY":GOSUB 2220
1020 CB$="AF":CE$="AF":Y$="YYYY":GOSUB 2220
1030 CB$="AO":CE$="AO":Y$="YYYYY":GOSUB 2220
1040 CB$="AP":CE$="AP":Y$="YYYYY":GOSUB 2220
1050 CB$="AR":CE$="AR":Y$="YYNYYYY":GOSUB 2220
1060 CB$="AS":CE$="AS":Y$="YYNYYYY":GOSUB 2220
1070 CB$="AT":CE$="AT":Y$="NYNYYNYNYNY":GOSUB 2220
1080 CB$="AU":CE$="AU":Y$="NYNYNYNYNYNY":GOSUB 2220
1090 CB$="AV":CE$="AV":Y$="NYNYNYNYNYNY":GOSUB 2220
1100 CB$="AW":CE$="AW":Y$="NYNYNYNYNYNY":GOSUB 2220
1110 CB$="AX":CE$="AX":Y$="YYYYYYYYYYYY":GOSUB 2220
1120 CB$="AY":CE$="AY":Y$="YYYYYYYYYYYY":GOSUB 2220
1130 CB$="CY":CE$="CY":Y$="YYYY":GOSUB 2220
1140 CB$="CZ":CE$="CZ":Y$="YYYY":GOSUB 2220
1150 CB$="DA":CE$="DA":Y$="YYYY":GOSUB 2220
1160 CB$="DC":CE$="DC":Y$="YYYY":GOSUB 2220
1170 CB$="DD":CE$="DD":Y$="YYYY":GOSUB 2220
1180 CB$="DE":CE$="DE":Y$="YYYY":GOSUB 2220
1190 CB$="DF":CE$="DF":Y$="YYYY":GOSUB 2220
1200 CB$="DG":CE$="DG":Y$="YYYY":GOSUB 2220
1210 CB$="DH":CE$="DH":Y$="YYYY":GOSUB 2220
1220 FOR J=1 TO LPR:W$="A"+STR$(RB+J-1):GOSUB 2130
1230 GOSUB 2260:W$=PRM$(0,J):GOSUB 2130:GOSUB 2270:NEXT J
1240 W$="/UO"+RB$+":O"+RE$:GOSUB 2130
1250 W$="/CA"+RB$+":A"+RE$+",O"+RB$:GOSUB 2130
1260 W$="/UAC"+RB$+":AC"+RE$:GOSUB 2130
1270 W$="/CA"+RB$+":A"+RE$+",AC"+RB$:GOSUB 2130
1280 W$="/UAO"+RB$+":AO"+RE$:GOSUB 2130
1290 W$="/CA"+RB$+":A"+RE$+",AO"+RB$:GOSUB 2130
1300 W$="/UDB"+RB$+":DB"+RE$:GOSUB 2130
1310 W$="/CA"+RB$+":A"+RE$+",DB"+RB$:GOSUB 2130
1320 REM REPLICATE THE TOP HALF OF THE NAMETEMP SUPPORT WORKSHEET
1330 W$="/RA7:CT7,A8:A"+STR$(7+LPR-1):GOSUB 2130
1340 RB=7:GOSUB 2210
1350 CB$="K":CE$="K":Y$="YYNYYYNYYYNYY":GOSUB 2220
1360 CB$="L":CE$="L":Y$="YYN":GOSUB 2220
1370 CB$="M":CE$="M":Y$="YYNYY":GOSUB 2220
1380 CB$="N":CE$="N":Y$="YYYYYYYYN":GOSUB 2220
1390 CB$="T":CE$="T":Y$="NYNYYYY":GOSUB 2220
1400 CB$="BT":CE$="BT":Y$="NYYYYYY":GOSUB 2220
1410 CB$="BU":CE$="BU":Y$="YN":GOSUB 2220
1420 CB$="BV":CE$="BV":Y$="NYYYYY":GOSUB 2220
1430 CB$="BW":CE$="BW":Y$="YN":GOSUB 2220
1440 CB$="BX":CE$="BX":Y$="NYY":GOSUB 2220
1450 CB$="BY":CE$="BY":Y$="NYY":GOSUB 2220
1460 CB$="BZ":CE$="BZ":Y$="YYN":GOSUB 2220
1470 CB$="CA":CE$="CA":Y$="NYNYNYNYNYNYYYY":GOSUB 2220
1480 CB$="CB":CE$="CB":Y$="NYNYNYNYNYNYYYY":GOSUB 2220
1490 CB$="CC":CE$="CC":Y$="NYNYNYNYNYNYYYY":GOSUB 2220
1500 CB$="CD":CE$="CD":Y$="NYNYNYNYNYNYYYY":GOSUB 2220
1510 CB$="CE":CE$="CE":Y$="NYNYYYYYY":GOSUB 2220
1520 CB$="CO":CE$="CO":Y$="NYN":GOSUB 2220
1530 CB$="CP":CE$="CP":Y$="NYN":GOSUB 2220
1540 CB$="CQ":CE$="CQ":Y$="NYN":GOSUB 2220
1550 CB$="CS":CE$="CS":Y$="NYN":GOSUB 2220
1560 CB$="CW":CE$="CW":Y$="YYYYY":GOSUB 2220
1570 CB$="CX":CE$="CX":Y$="YYYYY":GOSUB 2220
1580 CB$="CY":CE$="CY":Y$="YYY":GOSUB 2220
1590 CB$="CZ":CE$="CZ":Y$="YYY":GOSUB 2220
1600 CB$="DC":CE$="DC":Y$="YYYYY":GOSUB 2220
1610 CB$="DD":CE$="DD":Y$="YYYYY":GOSUB 2220
1620 CB$="DE":CE$="DE":Y$="YYYYYY":GOSUB 2220
1630 CB$="DF":CE$="DF":Y$="YYY":GOSUB 2220
1640 CB$="DG":CE$="DG":Y$="YYYYYY":GOSUB 2220
1650 CB$="DH":CE$="DH":Y$="YYY":GOSUB 2220
1660 FOR J=1 TO LPR:W$="A"+STR$(RB+J-1):GOSUB 2130
1670 GOSUB 2260:W$=PRM$(0,J):GOSUB 2130:GOSUB 2270:NEXT J
1680 W$="/UO"+RB$+":O"+RE$:GOSUB 2130
1690 W$="/CA"+RB$+":A"+RE$+",O"+RB$:GOSUB 2130
1700 W$="/UAC"+RB$+":AC"+RE$:GOSUB 2130
1710 W$="/CA"+RB$+":A"+RE$+",AC"+RB$:GOSUB 2130
1720 W$="/UAO"+RB$+":AO"+RE$:GOSUB 2130
1730 W$="/CA"+RB$+":A"+RE$+",AO"+RB$:GOSUB 2130
1740 W$="/UBE"+RB$+":BE"+RE$:GOSUB 2130
1750 W$="/CA"+RB$+":A"+RE$+",BE"+RB$:GOSUB 2130
1760 W$="/UBS"+RB$+":BS"+RE$:GOSUB 2130
1770 W$="/CA"+RB$+":A"+RE$+",BS"+RB$:GOSUB 2130
1780 W$="/UCG"+RB$+":CG"+RE$:GOSUB 2130
1790 W$="/CA"+RB$+":A"+RE$+",CG"+RB$:GOSUB 2130
1800 W$="/UCU"+RB$+":CU"+RE$:GOSUB 2130
1810 W$="/CA"+RB$+":A"+RE$+",CU"+RB$:GOSUB 2130
1820 W$="A1":GOSUB 2130:W$="B6":GOSUB 2130
1830 W$="/S"+XO$+FILE$+"WORK,A":GOSUB 2130
1840 W$="/Q,Y":GOSUB 2130
1850 CLOSE 1
1860 NAM$=XO$+FILE$+"THIN.XOT":OPEN"O",1,NAM$ 'WRITE FILE TO SAVE WORKSHEET
1870 W$="/S"+XO$+"T,V":GOSUB 2130
1880 TB$=STR$(7+LPR-1):BT$=STR$(7+LPR+10):BB$=STR$(7+LPR+10+LPR-1)
1890 W$="/S"+XO$+"T1,PAP7:X"+TB$:GOSUB 2130
1900 W$="/S"+XO$+"T2,PAD7:AL"+TB$:GOSUB 2130
1910 W$="/S"+XO$+"T3,PAAE"+BT$+":AM"+BB$:GOSUB 2130
1920 W$="/S"+XO$+"T4,PAAR7:AZ"+TB$:GOSUB 2130
1930 W$="/S"+XO$+"T5,PABF7:BN"+TB$:GOSUB 2130
1940 W$="/Z,Y":GOSUB 2130
1950 W$="/L"+XO$+"T,A":GOSUB 2130
1960 W$="/L"+XO$+"T1,A":GOSUB 2130
1970 W$="/L"+XO$+"T2,A":GOSUB 2130
1980 W$="/L"+XO$+"T3,A":GOSUB 2130
```

```
1990 W$="/L"+XO$+"T4,A":GOSUB 2130
2000 W$="/L"+XO$+"T5,A":GOSUB 2130
2010 W$="/DF"+XO$+"T":GOSUB 2130
2020 W$="/DF"+XO$+"T1":GOSUB 2130
2030 W$="/DF"+XO$+"T2":GOSUB 2130
2040 W$="/DF"+XO$+"T3":GOSUB 2130
2050 W$="/DF"+XO$+"T4":GOSUB 2130
2060 W$="/DF"+XO$+"T5":GOSUB 2130
2070 W$="=A1":GOSUB 2130
2080 W$="=B6":GOSUB 2130
2090 W$="{BEEP 2}":GOSUB 2190
2100 CLOSE 1
2110 SYSTEM
2120 END
2130 P0=INSTR(W$," "):IF P0=0 THEN 2150 'REMOVE BLANKS FROM STRING
2140 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 2130
2150 IF LEFT$(W$,1)="/" THEN GOTO 2190
2160 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2170 IF W$="!" THEN PRINT #1,"{CALC}";WSQ$:RETURN
2180 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2190 PRINT #1,W$;WSQ$:RETURN 'SAVE A STRING
2200 W$="/U":GOSUB 2150:W$="/B":GOSUB 2150:RETURN
2210 RB$=STR$(RB):RB1$=STR$(RB+1):RE$=STR$(RB+LPR-1):RETURN
2220 W$="/U"+CB$+RB1$+":"+CE$+RE$:GOSUB 2130 'SUBROUTINE TO REPLICATE AND ADJUST
A FORMULA
2230 W$="/R"+CB$+RB$+":"+CE$+RB$+","+CB$+RB1$+":"+CB$+RE$+",A"+Y$:GOSUB
2130:RETURN
2240 W$="="+P$:GOSUB 2130:W$=FILE$+"WORK":GOSUB 2130:GOSUB 2270:RETURN
2250 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
2260 PRINT #1,"/U";WW$;WSQ$:RETURN 'UNPROTECT A CELL
2270 PRINT #1,"/P";WW$;WSQ$:RETURN 'PROTECT A CELL
```

```
            SWOPSIM Program
-------------------------------------------------------------------------
BLANK       Optional program to BLANK out unneeded parts of country
            elasticity matrices and make any other adjustments
            for the model country file NAMEbCD.
REQUIREMENTS Country model file NAMEbCD.CAL on the D: drive.
            The ASCII file NAMEBLNK.TXT (containing cell blocks to be
            blanked) and the ASCII SuperCalc 5 macro file NAMEXQT.XQT
            (containing macros to make adjustments, write formulas,
            etc.) must be on the C:\NAME subdirectory.  (Caution,
            if some country models do not have equations for some
            sectors, NAMEXQT.XQT's actions may have to be manually
            erased for these sectors after BLANK is run).
OUTPUT (D:) Blanked/adjusted country model file.
-------------------------------------------------------------------------
COMMAND     BLANK NAME CD
-------------------------------------------------------------------------

:BLANK
```

```
ECHO OFF
CLS
ECHO              SWOPSIM Program
ECHO -------------------------------------------------------------------------
ECHO BLANK        Optional program to BLANK out unneeded parts of country
ECHO              elasticity matrices and make any other adjustments
ECHO              for the model country file NAMEbCD.
ECHO REQUIREMENTS Country model file NAMEbCD.CAL on the D: drive.
ECHO              The ASCII file NAMEBLNK.TXT (containing cell blocks to be
ECHO              blanked) and the ASCII SuperCalc 5 macro file NAMEXQT.XQT
ECHO              (containing macros to make adjustments, write formulas,
ECHO              etc.) must be on the C:\NAME subdirectory.  (Caution,
ECHO              if some country models do not have equations for some
ECHO              sectors, NAMEXQT.XQT's actions may have to be manually
ECHO              erased for these sectors after BLANK is run).
ECHO OUTPUT (D:)  Blanked/adjusted country model file.
ECHO -------------------------------------------------------------------------
ECHO COMMAND      BLANK NAME CD
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: BLANK NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: BLANK NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST C:\%1\%1b%2.CAL GOTO C2
ECHO ERROR = C:\%1\%1bCAL does not exist on the C:\%1 subdirectory
GOTO END
:C2
IF EXIST C:\%1\%1BLNK.TXT GOTO C3
ECHO ERROR = C:\%1\%1BLNK.TXT (file of cells to be blanked) does not
ECHO         exist on the C:\%1 subdirectory
GOTO END
:C3
IF EXIST C:\%1\%1XQT.XQT GOTO C4
ECHO ERROR = C:\%1\%1XQT.XQT (file of Supercalc 3 macro - XQT -commands)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C4
IF EXIST D:%1b%2.CAL GOTO C5
ECHO ERROR = D:%1b%2.CAL (country model file to be blanked)
ECHO         does not exist on the D: drive
GOTO END
:C5
IF EXIST C:\%1\%1b%2.CAL GOTO C6
ECHO ERROR = C:\%1\%1b%2.CAL (country model file to be copied)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C6
IF EXIST C:\%1\%1t%2.CAL GOTO C7
```

```
ECHO ERROR = C:\%1\%1t%2.CAL (country base data to be copied)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C7
COPY C:\%1\%1.PRN D:
COPY C:\%1\%1BLNK.TXT D:
COPY C:\%1\%1XQT.XQT D:
ECHO %1, %2, >D:BLANK.TXT
C:\SWOPSIM\BLANK
CALL C:SC D:TEST
ERASE D:BLANK.TXT
ERASE D:%1.PRN
ERASE D:%1BLNK.TXT
ERASE D:%1XQT.XQT
ERASE D:TEST.XQT
DIR D:%1b??.CAL/W
:END ECHO ON
```

```
10 REM - BLANK - BLANK OUT UNWANTED PARTS OF COUNTRY/REGION MODEL
20 REM COUNTRY/REGION SPREADSHEETS MUST HAVE CREATED BY CREATE PROGRAM
30 CLS
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FILE
50 WSQ$="~"
60 PRINT"Program to blank out unwanted parts of country/region
spreadsheet.":PRINT
70 PRINT"Elasticities and base data will be entered from old spreadsheet"
80 PRINT"if it is available.":PRINT
90 OFILE$=XO$+"BLANK.TXT"
100 OPEN"I",1,OFILE$:INPUT #1,FILE$,CYY$:CLOSE 1 'READ MODEL AND COUNTRY CODE
110 SCMK$="b"
120 NAM$=FILE$+SCMK$
130 PRINT:PRINT"Reading master file - ";FILE$:PRINT
140 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 259 PRODUCTS
150 REM AN ELASTICITY LESS THAN -9.999 OR GREATER THAN 99.99 CAN CAUSE AN ERROR
160 REM IN THE EQUATION GENERATION PROCEDURE.  LARGE PRODUCT SETS AND RESULTING
170 REM LARGE ELASTICITY MATRICES NEED LONGER PROGRAM RUNNING TIMES
180 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
190 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
200 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
210 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
220 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
230 LCL=LEN(CL$)/2
240 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
250 FOR I=1 TO LCL
260 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
270 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
280 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
290 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
300 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
310 LCLL=LEN(CL$)/2
320 FOR I=1 TO LCLL
330 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
340 CL$=""
350 OFILE$=XO$+FILE$+".PRN"
360 OPEN"I",1,OFILE$
370 DIM D(123,42),IFEED(123)
380 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
390 LINE INPUT #1,W$
400 LINE INPUT #1,W$
410 LINE INPUT #1,W$
420 LINE INPUT #1,CY$
430 LINE INPUT #1,W$
440 STAR=(INSTR(CY$,"-")-11)/3
450 LCY=(LEN(CY$)-8)/3
460 IF STAR < LCY THEN LCY=STAR
470 FOR I=1 TO LCY
480 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):NEXT I
490 LPR=0
500 PRINT:PRINT"Product groups are:":PRINT
510 LPR=LPR+1
520 LINE INPUT#1,W$
530 WP$=MID$(W$,5,4)
540 ELINE$=MID$(W$,LCY*3+11,1):IF ELINE$="I" OR ELINE$="B" THEN IFEED(LPR)=1
ELSE IFEED(LPR)=0
550 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 570
560 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 550
570 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 650 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
580 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
590 X$=MID$(W$,(J-1)*3+9,3)
600 IF X$="  D" THEN X$="  2"
610 IF X$="  S" THEN X$="  3"
620 IF X$=" SD" OR X$=" DS" THEN X$="  4"
630 D(LPR,J)=VAL(X$):NEXT J
640 GOTO 510
650 PRINT:CLOSE 1:LPR=LPR-1
660 PRINT:PRINT:PRINT"Countries/regions ARE:":PRINT
670 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
680 PRINT:PRINT:CY$=CYY$:PRINT"Country ";CY$;" was chosen":PRINT
690 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
700 IF CY$=CYM$(0,JC) THEN 730
710 NEXT JC
720 GOTO 660
730 LF=0:LG=0 'COUNT NUMBER OF QUANTITIES INCLUDED IN S & D EQUATIONS IN MODEL
740 DIM DEMQT(123),SUPQT(123):IDPOS=0:ISPOS=0
750 FOR I=1 TO LPR: IF D(I,LCY)=2 OR D(I,LCY)=4 THEN 760 ELSE 790
760 LF=LF+1
770 IDPOS=IDPOS+1
780 DEMQT(IDPOS)=I
790 IF D(I,LCY)=3 OR D(I,LCY)=4 THEN 800 ELSE 830
800 LG=LG+1
810 ISPOS=ISPOS+1
820 SUPQT(ISPOS)=I
830 NEXT I
```

```
840 CY$=CYY$:PRINT:PRINT"Country ";CY$;" was selected":PRINT
850 OFILE$=XO$+FILE$+"BLNK.TXT" 'READ FILE OF PARTS TO BE BLANKED
860 DIM BLANK$(0,2500)
870 OPEN"I",1,OFILE$
880 IBLANK=0:CLS
890 IF EOF(1) THEN 920
900 IBLANK=IBLANK+1:LINE INPUT #1,BLANK$(0,IBLANK) 'READ IN PARTS TO BE BLANKED
910 PRINT BLANK$(0,IBLANK):GOTO 890
920 CLOSE 1
930 CLS
940 PRINT:PRINT"Doing other stuff for macros for blanking/updating
";FILE$;"b";CY$
950 OFILE$=XO$+"TEST.XQT":OPEN"O",1,OFILE$
960 W$="{MACRO}":GOSUB 2200
970 REM W$="{WINDOWSOFF}":GOSUB 1970
980 W$="{PANELOFF}":GOSUB 2170
990 W$="{STATUS "+CHR$(34)+"Blanking out and updating country model file:
"+FILE$+SCMK$+CY$+CHR$(34)+"}":GOSUB 2170
1000 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2170
1010 W$="/L"+XO$+FILE$+SCMK$+CY$+",A":GOSUB 2100 'LOAD COUNTRY FILE
1020 CSUPE$=CLM$(0,LPR+LG+1) 'END SUPPLY ELASTICITY COLUMN
1030 CDEME$=CLM$(0,LPR+LF+4+1) 'END DEMAND ELASTICITY COLUMN
1040 W$="/BE1:J1":GOSUB 2100 'BLANK OLD EXCHANGE RATE AND TRANS. ELAS
1050 W$="/L"+XI$+FILE$+"\"+FILE$+SCMK$+CY$+",PE1:X1,E1":GOSUB 2100 'LOAD OLD
EXHANGE RATES AND GROWTH RATES
1060 W$="/US1:S1":GOSUB 2100:W$="/BS1:S1":GOSUB 2100
1070
W$="/L"+XI$+FILE$+"\"+FILE$+SCMK$+CY$+",PB4:"+CSUPE$+STR$(3+LPR)+",B4":GOSUB
2100 'LOAD OLD SUPPLY ELASTICITIES
1080
W$="/L"+XI$+FILE$+"\"+FILE$+SCMK$+CY$+",PB"+STR$(5+LPR)+":"+CDEME$+STR$(5+LPR+LP
R)+",B"+STR$(5+LPR):GOSUB 2100 'LOAD OLD DEMAND ELASTICITIES
1090
W$="/L"+XI$+FILE$+"\"+FILE$+"t"+CY$+",PE3:F"+STR$(2+LPR)+",G"+STR$(2*LPR+9):GOSU
B 2100 'LOAD BASE DATA
1100 W$="/UG"+STR$(2*LPR+9)+":H"+STR$(2*LPR+10+LPR):GOSUB 2100
1110 W$="/FEG"+STR$(2*LPR+9)+":H"+STR$(2*LPR+10+LPR)+",I":GOSUB 2100
1120
W$="/L"+XI$+FILE$+"\"+FILE$+SCMK$+CY$+",PAG"+STR$(2*LPR+9)+":AM"+STR$(2*LPR+10+L
PR)+",AG"+STR$(2*LPR+9):GOSUB 2100 'LOAD OLD INCOME ELAS., GROWTH RATES, AND
SUPPORT DATA
1130 REM COPY WORLD PRICES INTO DOMESTIC PRICE COLUMNS
1140 EQB$=STR$(2*LPR+9):EQE$=STR$(2*LPR+8+LPR)
1150 W$="/UB"+EQB$+":B"+EQE$:GOSUB 2100
1160 W$="/FEB"+EQB$+":B"+EQE$+",I":GOSUB 2100
1170 W$="/PB"+EQB$+":B"+EQE$:GOSUB 2100
1180 W$="/RB"+EQB$+":B"+EQE$+",C"+EQB$+":E"+EQB$:GOSUB 2100
1190 W$="/UC"+EQB$+":E"+EQE$:GOSUB 2100
1200 FOR K=1 TO LCY 'FIND COUNTRY NUMBER
1210 IF CY$=CYM$(0,K) THEN 1230
1220 NEXT K
1230 COL$=CLM$(0,LPR+1+LG+2+1)
1240 W$="/U"+COL$+"3:"+COL$+STR$(3+LPR):GOSUB 2100
1250 W$="="+COL$+"3":GOSUB 2100
1260 W$=CHR$(34)+"TCOLSUM":GOSUB 2100
1270 FOR J=1 TO LPR 'ADD TARGET COLUMN SUM FOR SUPPLY ELASTICITIES
1280 IF D(J,K)=0 THEN 1320
1290 W$="="+COL$+STR$(3+J):GOSUB 2100
1300 W$=".3"
1310 GOSUB 2100
1320 NEXT J
1330 REM
1340 COL$=CLM$(0,LPR+1+LF+1+1)
1350 W$="/U"+COL$+STR$(3+2+LPR)+":"+COL$+STR$(3+2+LPR+LPR):GOSUB 2100
1360 W$="="+COL$+STR$(3+2+LPR):GOSUB 2100
1370 W$=CHR$(34)+"TCOLSUM":GOSUB 2100
1380 FOR J=1 TO LPR 'ADD TARGET COLUMN SUM FOR DEMAND ELASTICITIES
1390 IF D(J,K)=0 THEN 1430
1400 W$="="+COL$+STR$(3+2+LPR+J):GOSUB 2100
1410 W$="-AH"+STR$(3+2+LPR+3+LPR+J)+"-.3"
1420 GOSUB 2100:GOSUB 2210
1430 NEXT J
1440 COL$=CLM$(0,LPR+1+LF+2+1)
1450 W$="/U"+COL$+STR$(3+2+LPR)+":"+COL$+STR$(3+2+LPR+LPR):GOSUB 2100
1460 W$="="+COL$+STR$(3+2+LPR):GOSUB 2100
1470 W$=CHR$(34)+"DSHRSUM":GOSUB 2100:GOSUB 2230
1480 FOR J=1 TO LPR 'SUM FEED AND OTHER DEMAND SHARES
1490 IF D(J,K)=0 THEN 1580
1500 IF IFEED(J)=0 THEN 1580
1510 W$="="+COL$+STR$(3+2+LPR+J):GOSUB 2100
1520 CB$=CLM$(0,LPR+1+1)
1530 CE$=CLM$(0,LPR+1+LF-1+1)
1540 W$="SUM("+CB$+STR$(5+LPR+J)+":"+CE$+STR$(5+LPR+F+J)+")"
1550 GOSUB 2100
1560 W$="/FE"+COL$+STR$(3+2+LPR+J)+":"+COL$+STR$(3+2+LPR+J)+",$":GOSUB 2100
1570 GOSUB 2230
1580 NEXT J
1590 W$="=A1":GOSUB 2100
1600 W$="/FEB4:"+CLM$(0,LPR+1)+STR$(3+LPR)+",$":GOSUB 2100
1610 W$="/FEB"+STR$(5+LPR)+":"+CLM$(0,LPR+LF+1)+STR$(4+2*LPR)+",$":GOSUB 2100
1620 FOR J=1 TO IBLANK
1630 PB$=BLANK$(0,J)
1640 IF LEFT$(PB$,4)="LOAD" THEN 1650 ELSE 1680
1650 PB$=RIGHT$(PB$,LEN(PB$)-5)
1660 W$="/L"+XI$+FILE$+"\"+FILE$+SCMK$+CYY$+",P"+PB$:GOSUB 2100
1670 GOTO 1690
1680 GOSUB 2180
1690 NEXT J
1700 FOR J=1 TO LPR
1710 IF D(J,K)<>0 THEN 1800
1720 W$="/UA"+STR$(J+3)+":"+CLM$(0,LPR*2+1)+STR$(J+3):GOSUB 2100
1730 W$="/BA"+STR$(J+3)+":"+CLM$(0,LPR*2+1)+STR$(J+3):GOSUB 2100
1740 W$="/UA"+STR$(J+5+LPR)+":"+CLM$(0,LPR*2+1)+STR$(J+5+LPR):GOSUB 2100
```

```
1750 W$="/BA"+STR$(J+5+LPR)+":"+CLM$(0,LPR*2+1)+STR$(J+5+LPR):GOSUB 2100
1760 W$="/U"+CLM$(0,LPR+LF+4+1)+STR$(J+5+LPR)+":"
1770 W$=W$+CLM$(0,LPR+LF+5+1)+STR$(J+5+LPR):GOSUB 2100
1780 W$="/B"+CLM$(0,LPR+LF+4+1)+STR$(J+5+LPR)+":"
1790 W$=W$+CLM$(0,LPR+LF+5+1)+STR$(J+5+LPR):GOSUB 2100
1800 NEXT J
1810 FOR J=1 TO LPR:FOR I=1 TO LPR
1820 REM CLOSE 2
1830 IF I=J THEN 1900
1840 CYYI$=PRM$(0,I):CYYJ$=PRM$(0,J):IF LEN(CYYI$)=2 AND LEN(CYYJ$)=2 THEN GOTO
1900
1850 IF (CYY$=LEFT$(CYYI$,2)) AND (CYY$=LEFT$(CYYJ$,2)) THEN GOTO 1900
1860 IF (CYY$=LEFT$(CYYI$,2)) AND (LEN(CYYJ$)=2) THEN GOTO 1900
1870 IF (CYY$=LEFT$(CYYJ$,2)) AND (LEN(CYYI$)=2) THEN GOTO 1900
1880 W$="/U"+CLM$(0,J+1)+STR$(I+3):GOSUB 2100
1890 W$="/B"+CLM$(0,J+1)+STR$(I+3):GOSUB 2100
1900 NEXT I
1910 NEXT J
1920 OFILE$=XO$+FILE$+"XQT.XQT" 'OPEN FILE OF MACROS TO BE EXECUTED
1930 OPEN"I",2,OFILE$
1940 IF EOF(2) THEN 1980
1950 LINE INPUT #2,W$ 'READ IN LINE OF .XQT COMMANDS
1960 GOSUB 2170 'WRITE OUT LINE TO BE EXECUTED
1970 GOTO 1940
1980 CLOSE 2
1990 W$="=A1":GOSUB 2170:GOSUB 2100
2000 W$="!":GOSUB 2100
2010 W$="!":GOSUB 2100
2020 W$="!":GOSUB 2100
2030 W$="/TV":GOSUB 2100
2040 W$=FILE$+SCMK$+CY$:GOSUB 2100:GOSUB 2230
2050 W$="/S"+XO$+FILE$+SCMK$+CY$+",OA":GOSUB 2100
2060 W$="{BEEP 2}":GOSUB 2170
2070 W$="/Q,Y":GOSUB 2100
2080 CLOSE 1:SYSTEM
2090 END
2100 P0=INSTR(W$," "):IF P0=0 THEN 2120 'REMOVE BLANKS FROM STRING
2110 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 2100
2120 IF LEFT$(W$,1)="/" THEN GOTO 2170
2130 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2140 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
2150 IF W$="!" THEN PRINT #1,"{CALC}";WSQ$:RETURN
2160 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}";WSQ$:RETURN
2170 PRINT #1,W$;WSQ$:RETURN 'SUBROUTINE TO PRINT W$ STRING
2180 W$="/U"+PB$:GOSUB 2100
2190 W$="/B"+PB$:GOSUB 2100:RETURN
2200 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
2210 PRINT #1,"/FE";WW$;",$";WSQ$:RETURN
2220 PRINT #1,"/U";WW$;WSQ$:RETURN
2230 PRINT #1,"/P";WW$;WSQ$:RETURN
```

The CUS.... series of programs are for non-standard (non-22 product) models.

```
                SWOPSIM Program
-------------------------------------------------------------------------
CUSBLANK        Optional program to do CUStomized BLANKout of unneeded
                parts of country elasticity matrices and make any other
                adjustments for the model country file NAMEbCD.
REQUIREMENTS    CUStomized country model file NAMEbCD.CAL on the D: drive.
                ASCII files NAMECD.TXT (containing cell blocks to be
                blanked) and ASCII SuperCalc 5 macro files NAMECD.XQT
                (containing macros to make adjustments, write formulas,
                etc.) must be on the C:\NAME subdirectory for each
                country/region in the NAME CUStomized model.  (Caution,
                if some country models do not have equations for some
                sectors, NAMECD.XQTs' actions may have to be manually
                erased for these sectors after BLANK is run).
OUTPUT (D:)     Blanked/adjusted country model file.
-------------------------------------------------------------------------
COMMAND         CUSBLANK NAME CD
-------------------------------------------------------------------------
```

```
:CUSBLANK
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO ------------------------------------------------------------------------
ECHO CUSBLANK       Optional program to do CUStomized BLANKout of unneeded
ECHO                parts of country elasticity matrices and make any other
ECHO                adjustments for the model country file NAMEbCD.
ECHO REQUIREMENTS   CUStomized country model file NAMEbCD.CAL on the D: drive.
ECHO                ASCII files NAMECD.TXT (containing cell blocks to be
ECHO                blanked) and ASCII SuperCalc 5 macro files NAMECD.XQT
ECHO                (containing macros to make adjustments, write formulas,
ECHO                etc.) must be on the C:\NAME subdirectory for each
ECHO                country/region in the NAME CUStomized model.  (Caution,
ECHO                if some country models do not have equations for some
ECHO                sectors, NAMECD.XQTs' actions may have to be manually
ECHO                erased for these sectors after BLANK is run).
ECHO OUTPUT (D:)    Blanked/adjusted country model file.
ECHO ------------------------------------------------------------------------
ECHO COMMAND        CUSBLANK NAME CD
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: CUSBLANK NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: CUSBLANK NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST C:\%1\%1b%2.CAL GOTO C2
ECHO ERROR = C:\%1\%1bCAL does not exist on the C:\%1 subdirectory
GOTO END
:C2
```

```
IF EXIST C:\%1\%1%2.TXT GOTO C3
ECHO ERROR = C:\%1\%1%2.TXT (file of cells to be blanked) does not
ECHO         exist on the C:\%1 subdirectory
GOTO END
:C3
IF EXIST C:\%1\%1%2.XQT GOTO C4
ECHO ERROR = C:\%1\%1%2.XQT (file of Supercalc 3 macro - XQT -commands)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C4
IF EXIST D:%1b%2.CAL GOTO C5
ECHO ERROR = D:%1b%2.CAL (country model file to be blanked)
ECHO         does not exist on the D: drive
GOTO END
:C5
IF EXIST C:\%1\%1b%2.CAL GOTO C6
ECHO ERROR = C:\%1\%1b%2.CAL (country model file to be copied)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C6
IF EXIST C:\%1\%1t%2.CAL GOTO C7
ECHO ERROR = C:\%1\%1t%2.CAL (country base data to be copied)
ECHO         does not exist on the C:\%1 subdirectory
GOTO END
:C7
COPY C:\%1\%1.PRN D:
COPY C:\%1\%1%2.TXT D:%1BLNK.TXT
COPY C:\%1\%1%2.XQT D:%1XQT.XQT
ECHO %1, %2, >D:BLANK.TXT
C:\SWOPSIM\BLANK
CALL C:SC D:TEST
ERASE D:BLANK.TXT
ERASE D:%1.PRN
ERASE D:%1BLNK.TXT
ERASE D:%1XQT.XQT
ERASE D:TEST.XQT
DIR D:%1b??.CAL/W
:END ECHO ON
```

```
            SWOPSIM Program
-------------------------------------------------------------------
WORK        Program to recalculate a country support spreadsheet
            for country CD in the model NAME.  WORK must be used if
            support/market price or base data is changed.
REQUIREMENTS Master support spreadsheet file NAMEWORK.CAL, country
            support spreadsheet file NAMEsCD.CAL, and country base
            data file CDMX.CAL on the C:\NAME subdirectory.
OUTPUT (D:) Two country/region support worksheets.  NAMEsCD.CAL
            contains the recalculated support information without
            formulas.  This file should be saved to the C:\NAME
            subdirectory.  NAMEsCDF.CAL contains the updated support
            information with calculating formulas for reference.  It
            need not be saved.  (If WORK is run in a multi-country
            loop only the last formula support sheet in the loop
            will remain).
-------------------------------------------------------------------
COMMAND     WORK NAME CD
-------------------------------------------------------------------
```

```
:WORK
ECHO OFF
CLS
ECHO              SWOPSIM Program
ECHO -------------------------------------------------------------------
ECHO WORK         Program to recalculate a country support spreadsheet
ECHO              for country CD in the model NAME.  WORK must be used if
ECHO              support/market price or base data is changed.
ECHO REQUIREMENTS Master support spreadsheet file NAMEWORK.CAL, country
ECHO              support spreadsheet file NAMEsCD.CAL, and country base
ECHO              data file CDMX.CAL on the C:\NAME subdirectory.
ECHO OUTPUT (D:)  Two country/region support worksheets.  NAMEsCD.CAL
ECHO              contains the recalculated support information without
ECHO              formulas.  This file should be saved to the C:\NAME
ECHO              subdirectory.  NAMEsCDF.CAL contains the updated support
ECHO              information with calculating formulas for reference.  It
ECHO              need not be saved.  (If WORK is run in a multi-country
ECHO              loop only the last formula support sheet in the loop
ECHO              will remain).
ECHO -------------------------------------------------------------------
ECHO COMMAND      WORK NAME CD
ECHO -------------------------------------------------------------------
IF FILE%1 == FILE  ECHO ERROR = You forgot model NAME; Enter: WORK NAME CD
IF FILE%1 == FILE  GOTO END
IF FILE%2 == FILE  ECHO ERROR = You forgot country CoDe; Enter: WORK NAME CD
IF FILE%2 == FILE  GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:%1 subdirectory.
GOTO END
:C1
IF EXIST C:\%1\%1WORK.CAL GOTO C2
ECHO ERROR = C:\%1\%1WORK.CAL has not been created AND saved. Use CREATEWK to
ECHO create the file and manually save it on C:\%1.
GOTO END
:C2
IF EXIST C:\%1\%1s%2.CAL GOTO C3
ECHO ERROR = C:\%1\%1s%2.CAL has not been created.
GOTO END
:C3
IF EXIST C:\%1\%1t%2.CAL GOTO C4
ECHO ERROR = C:\%1\%1t%2.CAL does not exist on C:%1.
GOTO END
:C4
IF EXIST C:\%1\%1s%2.CAL GOTO C5
```

```
ECHO ATTENTION: C:\%1\%1s%2.CAL does not exist.  There is no support file to
ECHO update.  Program will copy a blank master support file to the output
ECHO drive and continue.
COPY C:\%1\%1WORK.CAL D:%1s%2.CAL
:C5
IF EXIST C:\%1\%1s%2.CAL GOTO C6
GOTO C7
:C6
IF EXIST D:%1s%2.CAL ERASE D:%1s%2.CAL
COPY C:\%1\%1s%2.CAL D:
:C7
IF EXIST D:%1s??F.CAL ERASE D:%1s??F.CAL
COPY C:\%1\%1.PRN D:
COPY C:\%1\%1THIN.XQT D:
COPY C:\%1\%1ADD.XQT D:
ECHO %1, %2, >D:WORK.TXT
C:\SWOPSIM\WORK
COPY D:TEST.XQT+D:%1ADD.XQT+D:FINISH1.XQT+D:%1THIN.XQT+D:FINISH2.XQT D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:WORK.TXT
ERASE D:%1.PRN
ERASE D:%1THIN.XQT
ERASE D:FINISH1.XQT
ERASE D:FINISH2.XQT
ERASE D:%1ADD.XQT
ERASE D:SCRATCH.XQT
CLS
DIR D:%1s???.CAL/W
:END ECHO ON

10 REM -WORK- SET UP POLICY WORKSHEET FOR A COUNTRY
20 CLS:PRINT
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
40 WSQ$="~"
50 PRINT"PROGRAM TO CREATE A BLANK COUNTRY WORKSHEET FOR SUPPORT MEASURES"
60 PRINT
70 OFILE$=XO$+"WORK.TXT"
80 OPEN"I",1,OFILE$:INPUT #1,FILE$,CYY$:CLOSE 1
90 NAM$=FILE$+"b"
100 PRINT:PRINT"Reading master file - ";FILE$:PRINT
110 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN ABOUT UP TO 110 PRODUCT GROUPS
120 DIM PRMO(123) 'VECTOR OF CODES TO OMIT PRODUCT IN FORMULA GENERATION
130 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
140 DIM CYMO(42) 'VECTOR OF CODES TO OMIT COUNTRY/REGION FROM MODEL (0=OMIT)
150 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
160 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
170 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
180 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
190 LCL=LEN(CL$)/2
200 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
210 FOR I=1 TO LCL
220 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
230 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
240 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
250 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
260 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
270 LCLL=LEN(CL$)/2
280 FOR I=1 TO LCLL
290 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
300 CL$=""
310 OFILE$=XO$+FILE$+".PRN"
320 OPEN"I",1,OFILE$
330 DIM D(123,42)
340 LINE INPUT #1,W$ 'BEGIN READING MASTER PRN FILE
350 LINE INPUT #1,W$
360 LINE INPUT #1,W$
370 LINE INPUT #1,W$
380 LINE INPUT #1,CY$
390 LINE INPUT #1,W$
400 STAR=(INSTR(CY$,"-")-11)/3
410 LCY=(LEN(CY$)-8)/3
420 IF STAR < LCY THEN LCY=STAR
430 PRINT:PRINT"Countries/regions are:":PRINT
440 FOR I=1 TO LCY
450 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
460 LPR=0
470 PRINT:PRINT:PRINT"Product groups are:":PRINT
480 LPR=LPR+1
490 LINE INPUT#1,W$
500 WP$=MID$(W$,5,4)
510 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 530
520 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 510
530 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 610 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
540 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
550 X$=MID$(W$,(J-1)*3+9,3)
560 IF X$="  D" THEN X$="  2"
570 IF X$="  S" THEN X$="  3"
580 IF X$=" SD" OR X$=" DS" THEN X$="  4"
590 D(LPR,J)=VAL(X$):NEXT J
600 GOTO 480
610 CLOSE 1
620 LPR=LPR-1
630 CLS:PRINT:PRINT"Countries/regions are:":PRINT
640 FOR J=1 TO LCY:PRINT CYM$(0,J);" ";:NEXT J:PRINT:PRINT
650 V$=RIGHT$(STR$(15+LPR),LEN(STR$(15+LPR))-1)
660 OFILE$=XO$+"TEST.XQT"
670 OPEN"O",1,OFILE$
680 W$="{MACRO}":GOSUB 1720
690 W$="{WINDOWSOFF}":GOSUB 1700
700 W$="{PANELOFF}":GOSUB 1700
710 W$="{STATUS "+CHR$(34)+"Updating support spreadsheet:
"+FILE$+"s"+CYY$+CHR$(34)+"}"
```

```
720 GOSUB 1700
730 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1700
740 W$="/L"+XI$+FILE$+"\"+FILE$+"WORK.CAL,A":GOSUB 1650
750 CY$=CYY$:PRINT:PRINT"Country ";CY$;" was chosen":PRINT
760 FOR JC=1 TO LCY 'CHECK COUNTRY/REGION NAME
770 IF CY$=CYM$(0,JC) THEN 800
780 NEXT JC
790 GOTO 750
800 PS$="A5":GOSUB 1600
810 PS$="A"+V$:GOSUB 1600
820 PS$="O5":GOSUB 1600
830 PS$="O"+V$:GOSUB 1600
840 PS$="AC5":GOSUB 1600
850 PS$="AC"+V$:GOSUB 1600
860 PS$="AQ5":GOSUB 1600
870 PS$="AQ"+V$:GOSUB 1600
880 PS$="BE5":GOSUB 1600
890 PS$="BS5":GOSUB 1600
900 PS$="CG5":GOSUB 1600
910 PS$="CU5":GOSUB 1600
920 PS$="CT"+V$:GOSUB 1600
930 W$="=A1":GOSUB 1650
940  MR$=STR$(3+LPR-1):MR$=RIGHT$(MR$,LEN(MR$)-1)
950 MT$=STR$(9+2*LPR):MB$=STR$(9+2*LPR+LPR-1):BR$=STR$(7+LPR-1)
960
MT$=RIGHT$(MT$,LEN(MT$)-1):MB$=RIGHT$(MB$,LEN(MB$)-1):BR$=RIGHT$(BR$,LEN(BR$)-1)
970 REM LOAD WORLD PRICES FROM COUNTRY/REGION MODEL
980 W$="/L"+XI$+FILE$+"\"+FILE$+"b"+CY$+",PB"+MT$+":B"+MB$+",B7"
990 GOSUB 1650
1000 REM LOAD SUPPLY-DEMAND QUANTITIES FROM COUNTRY\REGION NAMEtCD BASE DATA
FILE
1010 W$="/L"+XI$+FILE$+"\"+FILE$+"t"+CY$+",PE3:F"+MR$+",C7,V"
1020 GOSUB 1650
1030 W$="/UB7:D"+BR$:GOSUB 1650
1040 W$="/FEB7:D"+BR$+",U1":GOSUB 1650
1050 W$="/PB7:D"+BR$:GOSUB 1650
1060 REM LOAD GROSS EXPORT DATA FROM COUNTRY/REGION NAMEtCD BASE DATA FILE
1070 W$="/L"+XI$+FILE$+"\"+FILE$+"t"+CY$+",PC3:C"+MR$+",G7,V":GOSUB 1650
1080 REM LOAD GROSS IMPORT DATA FROM COUNTRY/REGION NAMEtCD BASE DATA FILE
1090 W$="/L"+XI$+FILE$+"\"+FILE$+"t"+CY$+",PB3:B"+MR$+",H7,V":GOSUB 1650
1100 W$="/UG7:H"+BR$:GOSUB 1650
1110 W$="/FEG7:H"+BR$+",U1":GOSUB 1650
1120 W$="/PG7:H"+BR$:GOSUB 1650
1130 W$="!":GOSUB 1650
1140 W$="=A1":GOSUB 1650
1150 GOSUB 1900
1160 W$=FILE$+"s"+CY$
1170 GOSUB 1650
1180 GOSUB 1910
1190 C$="O1":GOSUB 1710
1200 C$="O"+STR$(LPR+11):GOSUB 1710
1210 C$="W"+STR$(LPR+10):GOSUB 1710
1220 C$="AC1":GOSUB 1710
1230 C$="AQ1":GOSUB 1710
1240 C$="BE1":GOSUB 1710
1250 C$="BS1":GOSUB 1710
1260 C$="CG1":GOSUB 1710
1270 C$="CU1":GOSUB 1710
1280 W$="=B6":GOSUB 1650
1290 BT$=RIGHT$(STR$(6+LPR),LEN(STR$(6+LPR))-1)
1300 BB$=RIGHT$(STR$(16+2*LPR),LEN(STR$(16+2*LPR))-1)
1310 TB$=RIGHT$(STR$(17+LPR),LEN(STR$(17+LPR))-1)
1320 F$="/L"+XO$+FILE$+"s"+CYY$+",P"
1330 W$=F$+"F7:F"+BT$+",F7":GOSUB 1650
1340 W$=F$+"P7:BR"+BT$+",P7":GOSUB 1650
1350 W$=F$+"Z"+TB$+":AA"+BB$+",Z"+TB$:GOSUB 1650
1360 W$=F$+"AD"+TB$+":AN"+BB$+",AD"+TB$:GOSUB 1650
1370 W$=F$+"CU"+TB$+":CX"+BB$+",CU"+TB$:GOSUB 1650
1380 W$=F$+"Y1:AB5,Y1":GOSUB 1650
1390 W$=F$+"AM1:AP5,AM1":GOSUB 1650
1400 W$=F$+"BA1:BD5,BA1":GOSUB 1650
1410 W$=F$+"BO1:BR5,BO1":GOSUB 1650
1420 W$=F$+"K1:K1,K1":GOSUB 1650
1430 W$=F$+"J2:J2,J2":GOSUB 1650
1440 W$=F$+"D2:D2,D2":GOSUB 1650
1450 W$="=A1":GOSUB 1700:W$="=B6":GOSUB 1700
1460 CLOSE 1
1470 OFILE$=XO$+"FINISH1.XQT":OPEN"O",1,OFILE$
1480 W$="!":GOSUB 1650
1490 W$="/S"+XO$+FILE$+"s"+CY$+"F,A"
1500 GOSUB 1650
1510 CLOSE 1
1520 OFILE$=XO$+"FINISH2.XQT":OPEN"O",1,OFILE$
1530 W$="/S"+XO$+FILE$+"s"+CY$+",OA"
1540 GOSUB 1650
1550 W$="{BEEP 2}":GOSUB 1650
1560 W$="/Q,Y":GOSUB 1650
1570 CLOSE 1
1580 ENDD$="ADD":GOSUB 1730:ENDD$="THIN":GOSUB 1730
1590 SYSTEM
1600 W$="="+PS$:GOSUB 1650
1610 GOSUB 1900
1620 W$=CHR$(34)+CY$:GOSUB 1650
1630 GOSUB 1910
1640 RETURN
1650 IF LEFT$(W$,1)="/" THEN GOTO 1700
1660 IF W$="!" THEN W$="{CALC}":GOTO 1700
1670 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
1680 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
1690 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
1700 PRINT #1,W$;WSQ$:RETURN
1710 W$="/U"+C$:GOSUB 1870:GOSUB 1650:W$="/CA1:A1,"+C$:GOSUB 1870:GOSUB
1650:RETURN
```

```
1720 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
1730 IFILE$=XO$+FILE$+ENDD$+".XQT"
1740 OFILE$=XO$+"SCRATCH.XQT"
1750 OPEN"I",1,IFILE$
1760 OPEN"O",2,OFILE$
1770 IF EOF(1) THEN 1800
1780 LINE INPUT #1,W$
1790 PRINT #2,W$:GOTO 1770
1800 CLOSE 1:CLOSE 2
1810 OPEN"I",1,OFILE$
1820 OPEN"O",2,IFILE$
1830 IF EOF(1) THEN 1850
1840 LINE INPUT #1,W$:PRINT #2,W$:GOTO 1830
1850 CLOSE 1:CLOSE 2
1860 RETURN
1870 LL=INSTR(W$," ") 'SUBROUTINE TO REMOVE BLANKS FROM A STRING
1880 IF LL=0  THEN RETURN
1890 W$=LEFT$(W$,LL-1)+RIGHT$(W$,LEN(W$)-LL):GOTO 1870
1900 PRINT #1,"/U";WW$;WSQ$:RETURN
1910 PRINT #1,"/P";WW$;WSQ$:RETURN
```

```
                SWOPSIM Program
-------------------------------------------------------------------
SUPPORT         Program to add prices and price wedges from a support
                spreadsheet and base data from a quantity base data
                spreadsheet to a country model spreadsheet NAMEbCD.CAL.
                (Caution, if NAMEbCD.CAL contains formulas relating
                elasticities, calculated elasticities may change--check
                new elasticities manually before running EQUATION to
                to re-initialize the model).
REQUIREMENTS    Country model spreadsheet NAMEbCD.CAL, support
                spreadsheet NAMEsCD.cal, and base quantity data
                spreadsheet NAMEtCD.CAL must be on C:\NAME model
                subdirectory.
OUTPUT (D:)     Country model spreadsheet with new prices, price wedges,
                and base quantity data.
-------------------------------------------------------------------
COMMAND         SUPPORT NAME CD
-------------------------------------------------------------------
```

```
:SUPPORT
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO ---------------------------------------------------------------------
ECHO SUPPORT        Program to add prices and price wedges from a support
ECHO                spreadsheet and base data from a quantity base data
ECHO                spreadsheet to a country model spreadsheet NAMEbCD.CAL.
ECHO                (Caution, if NAMEbCD.CAL contains formulas relating
ECHO                elasticities, calculated elasticities may change--check
ECHO                new elasticities manually before running EQUATION to
ECHO                to re-initialize the model).
ECHO REQUIREMENTS   Country model spreadsheet NAMEbCD.CAL, support
ECHO                spreadsheet NAMEsCD.cal, and base quantity data
ECHO                spreadsheet NAMEtCD.CAL must be on C:\NAME model
ECHO                subdirectory.
ECHO OUTPUT (D:)    Country model spreadsheet with new prices, price wedges,
ECHO                and base quantity data.
ECHO ---------------------------------------------------------------------
ECHO COMMAND        SUPPORT NAME CD
ECHO ---------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: SUPPORT NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: SUPPORT NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST C:\%1\%1t%2.CAL GOTO C2
ECHO ERROR = C:\%1\%1t%2.CAL does not exist on the C:\%1 subdirectory
GOTO END
:C2
IF EXIST C:\%1\%1b%2.CAL GOTO C3
ECHO ERROR = C:\%1\%1bCAL does not exist on the C:\%1 subdirectory
GOTO END
:C3
IF EXIST C:\%1\%1s%2.CAL GOTO C4
ECHO ERROR = C:\%1\%1s%2.CAL (support worksheet for %2) does not
ECHO         exist on the C:\%1 subdirectory
GOTO END
:C4
IF EXIST D:%1b%2.CAL ERASE D:%1b%2.CAL
COPY C:\%1\%1.PRN D:
ECHO %1, %2, >D:EQUATION.TXT
COPY C:\%1\%1s%2.CAL D:
COPY C:\%1\%1t%2.CAL D:
C:\SWOPSIM\SUPPORT
CALL C:SC D:TEST
ERASE D:%1s%2.CAL
ERASE D:TEST.XQT
ERASE D:%1.PRN
ERASE D:EQUATION.TXT
ERASE D:%1t%2.CAL
DIR D:%1b%2.CAL/W
:END ECHO ON
```

```
10 REM - SUPPORT - ADD SUPPORT MEASURES TO COUNTRY/REGION MODEL SPREADSHEET
20 CLS:PRINT:
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
40 WSQ$="~"
50 PRINT"Add support measures in country worksheet to model spreadsheet":PRINT
60 OFILE$=XO$+"EQUATION.TXT"
```

```
70 OPEN"I",1,OFILE$:INPUT #1,FILE$,CYY$:CLOSE 1 'READ MODEL AND COUNTRY CODE
80 NAM$=FILE$+"b"+CYY$
90 PRINT:PRINT"Reading master file - ";FILE$:PRINT
100 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 250 PRODUCT GROUPS
110 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
120 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
130 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
140 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
150 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
160 LCL=LEN(CL$)/2
170 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
180 FOR I=1 TO LCL
190 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
200 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
210 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
220 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
230 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
240 LCLL=LEN(CL$)/2
250 FOR I=1 TO LCLL
260 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
270 CL$=""
280 OFILE$=XO$+FILE$+".PRN"
290 OPEN"I",1,OFILE$
300 DIM D(123,42)
310 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
320 LINE INPUT #1,W$
330 LINE INPUT #1,W$
340 LINE INPUT #1,W$
350 LINE INPUT #1,CY$
360 LINE INPUT #1,W$
370 STAR=(INSTR(CY$,"-")-11)/3
380 LCY=(LEN(CY$)-8)/3
390 IF STAR < LCY THEN LCY=STAR
400 FOR I=1 TO LCY
410 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):NEXT I
420 LPR=0
430 PRINT:PRINT"Product groups are:":PRINT
440 LPR=LPR+1
450 LINE INPUT#1,W$
460 WP$=MID$(W$,5,4)
470 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 490
480 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 470
490 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 570 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
500 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
510 X$=MID$(W$,(J-1)*3+9,3)
520 IF X$="  D" THEN X$="  2"
530 IF X$="  S" THEN X$="  3"
540 IF X$=" SD" OR X$=" DS" THEN X$="  4"
550 D(LPR,J)=VAL(X$):NEXT J
560 GOTO 440
570 PRINT:CLOSE 1:LPR=LPR-1
580 PRINT:PRINT:PRINT"Countries/Regions are:":PRINT
590 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
600 PRINT:PRINT:CY$=CYY$:PRINT"Country ";CY$;" was chosen":PRINT
610 FOR JC=1 TO LCY 'COUNTRY/REGION CODE IS CHECKED
620 IF CY$=CYM$(0,JC) THEN 650
630 NEXT JC
640 SYSTEM
650 OFILE$=XO$+"TEST.XQT"
660 OPEN"O",1,OFILE$
670 W$="{MACRO}":GOSUB 1670
680 W$="{WINDOWSOFF}":GOSUB 1650
690 W$="{PANELOFF}":GOSUB 1650
700 W$="{STATUS "+CHR$(34)+"Reading support data from:
"+FILE$+"s"+CY$+CHR$(34)+"}"
710 GOSUB 1650
720 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1650
730 W$="/L"+XI$+FILE$+"\"+FILE$+"b"+CY$+",A"
740 GOSUB 1630
750 IO=LPR*2+8
760 PB$=STR$(17+LPR):PE$=STR$(17+LPR-1+LPR)
770 IB$=STR$(IO+1):IE$=STR$(IO+LPR):IT$=STR$(IO)
780 W$="/UC"+IB$+":E"+IE$:GOSUB 1630
790 MX$="/L"+XO$+FILE$+"t"+CY$
800 SUPPORT$="/L"+XO$+FILE$+"s"+CY$
810 W$=SUPPORT$+",PL"+PB$+":N"+PE$+",C"+IB$+",V":GOSUB 1630 'LOAD NEW PRICE DATA
FROM WORKSHEET
820 REM BLANK OUT OLD SUPPORT DATA IN MODEL SPREADSHEETS
830 W$="/UC"+IB$+":E"+IE$:GOSUB 1630
840 W$="/FEC"+IB$+":E"+IE$+",I":GOSUB 1630
850 W$="/UAJ"+IB$+":AM"+IE$:GOSUB 1630
860 W$="/BAJ"+IB$+":AM"+IE$:GOSUB 1630
870 W$="/UAZ"+IB$+":BA"+IE$:GOSUB 1630
880 W$="/BAZ"+IB$+":BA"+IE$:GOSUB 1630
890 W$="/UBK"+IB$+":BK"+IE$:GOSUB 1630
900 W$="/BBK"+IB$+":BK"+IE$:GOSUB 1630
910 W$="/UBQ"+IB$+":BR"+IE$:GOSUB 1630
920 W$="/BBQ"+IB$+":BR"+IE$:GOSUB 1630
930 W$="/UBU"+IB$+":BU"+IE$:GOSUB 1630
940 W$="/BBU"+IB$+":BU"+IE$:GOSUB 1630
950 W$="/UCA"+IB$+":CB"+IE$:GOSUB 1630
960 W$="/BCA"+IB$+":CB"+IE$:GOSUB 1630
970 W$="/UCG"+IB$+":CG"+IE$:GOSUB 1630
980 W$="/BCG"+IB$+":CG"+IE$:GOSUB 1630
990 W$="/UG"+IB$+":H"+IE$:GOSUB 1630
1000 W$="/FEG"+IB$+":H"+IE$+",I":GOSUB 1630
1010 W$=SUPPORT$+",PB"+PB$+":B"+PE$+",AJ"+IB$+",V":GOSUB 1630 'LOAD DPSW
1020 W$=SUPPORT$+",PC"+PB$+":C"+PE$+",AK"+IB$+",V":GOSUB 1630 'LOAD CSW
1030 W$=SUPPORT$+",PD"+PB$+":D"+PE$+",AM"+IB$+",V":GOSUB 1630 'LOAD ESW
1040 W$=SUPPORT$+",PE"+PB$+":E"+PE$+",AL"+IB$+",V":GOSUB 1630 'LOAD MSW
1050 W$=SUPPORT$+",PCC7:CD"+STR$(7+LPR-1)+",AZ"+IB$+",V":GOSUB 1630 'LOAD PBSE
AND CBSE
```

```
1060 W$=SUPPORT$+",PCA7:CB"+STR$(7+LPR-1)+",CA"+IB$+",V":GOSUB 1630 'LOAD MBSE
AND EBSE
1070 W$=SUPPORT$+",PCE7:CE"+STR$(7+LPR-1)+",CG"+IB$+",V":GOSUB 1630 'LOAD
RENTVAL
1080 W$=MX$+",PE3:F"+STR$(3+LPR-1)+",G"+IB$+",V":GOSUB 1630 'LOAD SUPPLY AND
DEMAND QUANTITIES FROM MX FILE
1090 W$=MX$+",PC3:C"+STR$(3+LPR-1)+",BQ"+IB$+",V":GOSUB 1630 'LOAD GROSS EXPORTS
FROM MX FILE
1100 W$=MX$+",PB3:B"+STR$(3+LPR-1)+",BR"+IB$+",V":GOSUB 1630 'LOAD GROSS IMPORTS
FROM MX FILE
1110 W$="/UBQ"+IB$+":BR"+IE$:GOSUB 1630
1120 W$="/UG"+IB$+":H"+IE$:GOSUB 1630
1130 W$="/FEG"+IB$+":H"+IE$+",I":GOSUB 1630
1140 W$="/FEBQ"+IB$+":BR"+IE$+",I":GOSUB 1630
1150 W$=SUPPORT$+",PAA"+PB$+":AA"+PE$+",BK"+IB$+",V":GOSUB 1630 'LOAD PTAXE
1160 W$=SUPPORT$+",PZ"+PB$+":Z"+PE$+",CR"+IB$+",V":GOSUB 1630 'LOAD SUPPLY
SHIFTER
1170 W$=SUPPORT$+",PV"+PB$+":V"+PE$+",CT"+IB$+",V":GOSUB 1630 'LOAD MARKET
SUPPORT RATE
1180 REM REFORMAT SUPPORT DATA IN COUNTRY MODEL SHEETS
1190 W$="/UAJ"+IB$+":AN"+IE$:GOSUB 1630
1200 W$="/FEAJ"+IB$+":AN"+IE$+",I":GOSUB 1630
1210 W$="/UCR"+IB$+":CR"+IE$:GOSUB 1630
1220 W$="/FECR"+IB$+":CR"+IE$+",$":GOSUB 1630
1230 W$="/UAC"+IB$+":AD"+IE$:GOSUB 1630
1240 W$="/CG"+IB$+":H"+IE$+",AC"+IB$:GOSUB 1630
1250 W$="/UAZ"+IB$+":BA"+IE$:GOSUB 1630
1260 W$="/FEAZ"+IB$+":BA"+IE$+",I":GOSUB 1630
1270 W$="/UBJ"+IB$+":BK"+IE$:GOSUB 1630
1280 W$="/FEBJ"+IB$+":BK"+IE$+",I":GOSUB 1630
1290 W$="/UCA"+IB$+":CB"+IE$:GOSUB 1630
1300 W$="/FECA"+IB$+":CB"+IE$+",I":GOSUB 1630
1310 W$="/UCG"+IB$+":CG"+IE$:GOSUB 1630
1320 W$="/FECG"+IB$+":CG"+IE$+",I":GOSUB 1630
1330 W$="/UBQ"+IB$+":BR"+IE$:GOSUB 1630
1340 W$="/FEBQ"+IB$+":BR"+IE$+",I":GOSUB 1630
1350 W$="/UCT"+IB$+":CT"+IE$:GOSUB 1630
1360 W$="/FECT"+IB$+":CT"+IE$+",I":GOSUB 1630
1370 W$="/UB"+IB$+":E"+IE$:GOSUB 1630
1380 W$="/UBU"+IB$+":BU"+IE$:GOSUB 1630
1390 W$="/CB"+IB$+":B"+IE$+",BU"+IB$:GOSUB 1630
1400 W$="=A1":GOSUB 1630
1410 FOR I=1 TO LPR 'CLEAN OUT ZEROS
1420 IF D(I,JC)=0 THEN 1430 ELSE 1540
1430 CELL$="C"+STR$(IO+I):GOSUB 1660
1440 CELL$="D"+STR$(IO+I):GOSUB 1660
1450 CELL$="E"+STR$(IO+I):GOSUB 1660
1460 CELL$="AJ"+STR$(IO+I):GOSUB 1660
1470 CELL$="AK"+STR$(IO+I):GOSUB 1660
1480 CELL$="AL"+STR$(IO+I):GOSUB 1660
1490 CELL$="AM"+STR$(IO+I):GOSUB 1660
1500 CELL$="AY"+STR$(IO+I):GOSUB 1660
1510 CELL$="AZ"+STR$(IO+I):GOSUB 1660
1520 CELL$="BA"+STR$(IO+I):GOSUB 1660
1530 CELL$="BK"+STR$(IO+I):GOSUB 1660
1540 NEXT I
1550 W$="!":GOSUB 1630
1560 W$="/S"+XO$+FILE$+"b"+CY$+",A"
1570 GOSUB 1630
1580 W$="{BEEP 1}":GOSUB 1650
1590 W$="/Q,Y":GOSUB 1630
1600 CLOSE 1
1610 SYSTEM
1620 END
1630 PO=INSTR(W$," "):IF PO=0 THEN 1650 'REMOVE BLANKS FROM STRING
1640 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 1630
1650 PRINT #1,W$;WSQ$:RETURN 'SUBROUTINE TO PRINT W$ STRING
1660 W$="="+CELL$:GOSUB 1630:W$="/U":GOSUB 1650:W$="/B":GOSUB 1650:RETURN
1670 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
```

```
                SWOPSIM Program
-------------------------------------------------------------------------
EQUATION        Program to initialize constants to base data, write
                equations, and write economic indicator formulas in
                country spreadsheet NAMEbCD.CAL.
REQUIREMENTS    Country spreadsheet NAMEbCD.CAL with base data,
                prices and price wedges, elasticities, and all other
                parameters must be on model subdirectory C:\NAME.
OUTPUT (D:)     New initialized country spreadsheet NAMEbCD.
-------------------------------------------------------------------------
COMMAND       EQUATION NAME CD
-------------------------------------------------------------------------

:EQUATION
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO -------------------------------------------------------------------------
ECHO EQUATION       Program to initialize constants to base data, write
ECHO                equations, and write economic indicator formulas in
ECHO                country spreadsheet NAMEbCD.CAL.
ECHO REQUIREMENTS   Country spreadsheet NAMEbCD.CAL with base data,
ECHO                prices and price wedges, elasticities, and all other
ECHO                parameters must be on model subdirectory C:\NAME.
ECHO OUTPUT (D:)    New initialized country spreadsheet NAMEbCD.
ECHO -------------------------------------------------------------------------
ECHO COMMAND       EQUATION NAME CD
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE  ECHO ERROR = You forgot model NAME; Enter: EQUATION NAME CD
IF FILE%1 == FILE  GOTO END
IF FILE%2 == FILE  ECHO ERROR = You forgot country CoDe; Enter: EQUATION NAME CD
IF FILE%2 == FILE  GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
```

```
ECHO ERROR = C:\%1\%1.PRN does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST C:\%1\%1b%2.CAL GOTO C2
ECHO ERROR = C:\%1\%1b%2.CAL does not exist on the C:\%1 subdirectory
GOTO END
:C2
COPY C:\%1\%1.PRN D:
COPY C:\%1\%1b%2.CAL D:
ECHO %1, %2, >D:EQUATION.TXT
C:\SWOPSIM\EQNA
CALL C:SC D:TEST
ERASE D:TEST.XQT
C:\SWOPSIM\EQNB
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:TEST.CAL
ERASE D:S???.PRN
ERASE D:D???.PRN
C:\SWOPSIM\EQNC
CALL C:SC D:TEST
ERASE D:TEST.TXT
ERASE D:TEST.XQT
ERASE D:SUPPLYEQ.PRN
ERASE D:DEMANDEQ.PRN
ERASE D:SCROSSO.PRN
ERASE D:DCROSSO.PRN
ERASE D:SCROSS.PRN
ERASE D:DCROSS.PRN
ERASE D:EQUATION.TXT
ERASE D:%1.PRN
DIR D:%1b%2.CAL/W
:END ECHO ON
```

```
10 REM - EQNA - PART A, CREATE EQUATIONS FOR COUNTRY/REGION MODEL
20 REM COUNTRY/REGION SPREADSHEETS MUST HAVE BASE PRICE AND QUANTITY DATA ADDED
TO THEM BEFORE THIS PROGRAM IS RUN
30 CLS 'SUP AND DEM PRINT FILES ARE TEMPORARILY CREATED
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 PRINT"Program to select a country/region for equation writing.":PRINT
70 PRINT"Elasticities and base data have to be added to country/region"
80 PRINT"files before this program is run.":PRINT
90 OFILE$=XO$+"EQUATION.TXT"
100 OPEN"I",1,OFILE$:INPUT #1,FILE$,CYY$:CLOSE 1 'READ MODEL AND COUNTRY CODE
110 NAM$=FILE$+"b"
120 PRINT:PRINT"Reading master file - ";FILE$:PRINT
130 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 110 PRODUCT GROUPS
140 REM AN ELASTICITY LESS THAN -9.999 OR GREATER THAN 99.99 CAN CAUSE AN ERROR
150 REM IN THE EQUATION GENERATION PROCEDURE.  LARGE PRODUCT SETS AND RESULTING
160 REM LARGE ELASTICITY MATRICES NEED LONGER PROGRAM RUNNING TIMES
170 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
180 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
190 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
200 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
210 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
220 LCL=LEN(CL$)/2
230 DIM CLM$(0,123)
240 FOR I=1 TO LCL '122 COLUMNS MAX.
250 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
260 OFILE$=XO$+FILE$+".PRN"
270 OPEN"I",1,OFILE$
280 DIM D(123,42)
290 LINE INPUT #1,W$ 'BEGIN READING MASTER ****.PRN FILE
300 LINE INPUT #1,W$
310 LINE INPUT #1,W$
320 LINE INPUT #1,W$
330 LINE INPUT #1,CY$
340 LINE INPUT #1,W$
350 STAR=(INSTR(CY$,"-")-11)/3
360 LCY=(LEN(CY$)-8)/3
370 IF STAR < LCY THEN LCY=STAR
380 IINPTU=0:IINPT=0:DIM INPTU$(0,123),INPT$(0,123) 'CREATE INPUT USER & INPUT
VECTORS
390 IDNPTU=0:IDNPT=0:DIM DNPTU$(0,123),DNPT$(0,123) 'CREATE INTERMEDIATE INPUT &
OUTPUT VECTORS
400 INTRD=0:DIM NTRD$(0,123) 'CREATE NON TRADED PRODUCT VECTORS
410 FOR I=1 TO LCY
420 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):NEXT I
430 LPR=0
440 PRINT:PRINT"Product groups are:":PRINT
450 LPR=LPR+1
460 LINE INPUT#1,W$
470 WP$=MID$(W$,5,4)
480 ELINE$=MID$(W$,LCY*3+10,2) 'IU OR I INPUT MARKERS
490 DLINE$=MID$(W$,LCY*3+13,2) 'IN OR OU INTEMEDIATE DEMAND MARKERS
500 TLINE$=MID$(W$,LCY*3+16,2) 'NT MARKERS
510 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 530
520 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 510
530 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 710 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" "; 'TEST IF COMMODITY FOR COUNTRY
540 IF RIGHT$(ELINE$,2)="IU" OR RIGHT$(ELINE$,2)="IB" THEN 550 ELSE 560 'CHECK
INPUT USERS AND INPUTS
550 IINPTU=IINPTU+1:INPTU$(0,IINPTU)=WP$
560 IF RIGHT$(ELINE$,1)="I" OR RIGHT$(ELINE$,2)="IB" THEN 570 ELSE 580
570 IINPT=IINPT+1:INPT$(0,IINPT)=WP$
580 IF RIGHT$(DLINE$,2)="IN" THEN 590 ELSE 600 'CHECK INTERM. INPUTS AND OUTPUTS
590 IDNPTU=IDNPTU+1:DNPTU$(0,IDNPTU)=WP$
600 IF RIGHT$(DLINE$,2)="OU" THEN 610 ELSE 620
610 IDNPT=IDNPT+1:DNPT$(0,IDNPT)=WP$
620 IF RIGHT$(TLINE$,2)="NT" THEN 630 ELSE 640
630 INTRD=INTRD+1:NTRD$(0,INTRD)=WP$
640 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
650 X$=MID$(W$,(J-1)*3+9,3)
```

```
660 IF X$="  D" THEN X$="  2"
670 IF X$="  S" THEN X$="  3"
680 IF X$=" SD" OR X$=" DS" THEN X$="  4"
690 D(LPR,J)=VAL(X$):NEXT J
700 GOTO 450
710 PRINT:CLOSE 1:LPR=LPR-1
720 PRINT:PRINT:PRINT"Countries/regions are:":PRINT
730 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
740 PRINT:PRINT:CY$=CYY$:PRINT"Country ";CY$;" was chosen":PRINT
750 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
760 IF CY$=CYM$(0,JC) THEN 790
770 NEXT JC
780 SYSTEM
790 LF=0:LG=0 'COUNT NUMBER OF QUANTITIES INCLUDED IN S & D EQUATIONS IN CTY
800 DIM DEMQT(123),SUPQT(123):IDPOS=0:ISPOS=0
810 FOR I=1 TO LPR: IF D(I,LCY)=2 OR D(I,LCY)=4 THEN 820 ELSE 850
820 LF=LF+1
830 IDPOS=IDPOS+1
840 DEMQT(IDPOS)=I
850 IF D(I,LCY)=3 OR D(I,LCY)=4 THEN 860 ELSE 890
860 LG=LG+1
870 ISPOS=ISPOS+1
880 SUPQT(ISPOS)=I
890 NEXT I
900 PRINT:FTEST$=XO$+"TEST.TXT"
910 OPEN"O",1,FTEST$
920 W$=NAM$+CY$
930 PRINT #1,W$
940 PRINT #1,LPR
950 PRINT #1,LG
960 FOR I=1 TO LG
970 PRINT #1,SUPQT(I):NEXT I
980 PRINT #1,LF
990 FOR I=1 TO LF
1000 PRINT #1,DEMQT(I):NEXT I
1010 FOR I=1 TO LPR
1020 IF D(I,JC)=0 THEN 1030 ELSE 1040
1030 PRINT #1,"**":GOTO 1050
1040 PRINT #1,PRM$(0,I)
1050 NEXT I
1060 REM PUT MARKERS ON OUTPUT FILE
1070 PRINT #1,IINPTU
1080 FOR I=1 TO IINPTU:PRINT #1,INPTU$(0,I):NEXT I
1090 PRINT:PRINT"Input using sectors are:":PRINT
1100 FOR I=1 TO IINPTU:PRINT INPTU$(0,I);" ";:NEXT I:PRINT
1110 PRINT #1,IINPT
1120 FOR I=1 TO IINPT:PRINT #1,INPT$(0,I):NEXT I
1130 PRINT:PRINT"Inputs are:":PRINT
1140 FOR I=1 TO IINPT:PRINT INPT$(0,I);" ";:NEXT I:PRINT
1150 PRINT #1,IDNPTU
1160 FOR I=1 TO IDNPTU:PRINT #1,DNPTU$(0,I):NEXT I
1170 PRINT:PRINT"Intermediate demand input sectors are:":PRINT
1180 FOR I=1 TO IDNPTU:PRINT DNPTU$(0,I);" ";:NEXT I:PRINT
1190 PRINT #1,IDNPT
1200 FOR I=1 TO IDNPT:PRINT #1,DNPT$(0,I):NEXT I
1210 PRINT:PRINT"Intermediate demand outputs are:":PRINT
1220 FOR I=1 TO IDNPT:PRINT DNPT$(0,I);" ";:NEXT I:PRINT
1230 PRINT #1,INTRD
1240 FOR I=1 TO INTRD:PRINT #1,NTRD$(0,I):NEXT I
1250 PRINT:PRINT"Non-traded product sectors are:":PRINT
1260 FOR I=1 TO INTRD:PRINT NTRD$(0,I);" ";:NEXT I:PRINT
1270 CLOSE 1
1280 OFILE$=XO$+"TEST.XQT"
1290 OPEN"O",1,OFILE$ 'WRITE OUT XQT FILE TO GET ELASTICITY MATRICES
1300 W$="{MACRO}":GOSUB 1610
1310 W$="{WINDOWSOFF}":GOSUB 1600
1320 W$="{PANELOFF}":GOSUB 1600
1330 W$="{STATUS "+CHR$(34)+"Creating ASCII supply, demand elasticity matrices
from model "+FILE$+" for -> "+CY$+CHR$(34)+"}":GOSUB 1600
1340 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1600
1350 W$="/L"+XO$+NAM$+CY$+",A":GOSUB 1570
1360 W$="/GB":GOSUB 1570
1370 W$="/FG6":GOSUB 1570
1380 W$="/OF~ORFN~~Q":GOSUB 1570
1390 BC$="B"
1400 ECD$=CLM$(0,LPR+1+LF)
1410 ECS$=CLM$(0,LPR+1+LG)
1420 FOR I=1 TO LPR
1430 BR$=STR$(3+I)
1440 ER$=STR$(3+I)
1450 W$="/OD"+BC$+BR$+":"+ECS$+ER$+",D"+XO$+"S"+STR$(I):GOSUB 1570 'WRITE SUPPLY
ELAS.
1460 NEXT I
1470 FOR I=1 TO LPR
1480 BR$=STR$(3+LPR+2+I)
1490 ER$=STR$(3+LPR+2+I)
1500 W$="/OD"+BC$+BR$+":"+ECD$+ER$+",D"+XO$+"D"+STR$(I):GOSUB 1570 'WRITE DEMAND
ELAS.
1510 NEXT I
1520 W$="{BEEP}":GOSUB 1600
1530 W$="/Q,Y":GOSUB 1570
1540 CLOSE 1
1550 SYSTEM
1560 END
1570 P0=INSTR(W$," "):IF P0=0 THEN 1590 'REMOVE BLANKS FROM STRING
1580 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 1570
1590 PRINT #1,W$;WSQ$:RETURN 'SUBROUTINE TO PRINT W$ STRING
1600 PRINT #1,W$;WSQ$:RETURN 'PRINT W$ WITH BLANKS
1610 PRINT #1,W$:RETURN 'PRINT STRING WITHOUT WSQ$

10 REM - EQNB - PART B, CREATE CONSTANTS AND EQUATIONS FOR COUNTRY/REGION
20 REM COUNTRY/REGION SPREADSHEETS MUST HAVE BASE PRICE AND QUANTITY DATA ADDED
TO THEM BEFORE THIS PROGRAM IS RUN
```

```
30 CLS 'A COUNTRY/REGION IS SELECTED AND AN XQT FILE OF EQUATIONS IS CREATED
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 OFILE$=XO$+"TEST.TXT"
70 OPEN"I",1,OFILE$
80 DIM SUPQT(123),DEMQT(123),INPTU$(0,123),INPT$(0,123),PRD$(0,123)
90 DIM DNPTU$(0,123),DNPT$(0,123),NTRD$(0,123)
100 INPUT #1,CY$:
110 INPUT #1,LPR
120 INPUT #1,LG
130 FOR I=1 TO LG
140 INPUT #1,SUPQT(I):NEXT I
150 INPUT #1,LF
160 FOR I=1 TO LF
170 INPUT #1,DEMQT(I):NEXT I
180 FOR I=1 TO LPR
190 INPUT #1,PRD$(0,I):NEXT I
200 INPUT #1,IINPTU
210 FOR I=1 TO IINPTU
220 INPUT #1,INPTU$(0,I):NEXT I
230 INPUT #1,IINPT
240 FOR I=1 TO IINPT
250 INPUT #1,INPT$(0,I):NEXT I
260 INPUT #1,IDNPTU
270 FOR I=1 TO IDNPTU
280 INPUT #1,DNPTU$(0,I):NEXT I
290 INPUT #1,IDNPT
300 FOR I=1 TO IDNPT
310 INPUT #1,DNPT$(0,I):NEXT I
320 INPUT #1,INTRD
330 FOR I=1 TO INTRD
340 INPUT #1,NTRD$(0,I):NEXT I
350 PRINT:PRINT"Doing stuff for model spreadsheet --> ";CY$:PRINT
360 CLOSE 1
370 OFILE$=XO$+"TEST.XQT"
380 OPEN"O",1,OFILE$
390 W$="{MACRO}":GOSUB 2380
400 W$="{WINDOWSOFF}":GOSUB 2370
410 W$="{PANELOFF}":GOSUB 2370
420 W$="{STATUS "+CHR$(34)+"Writing equations for:    "+CY$+CHR$(34)+"}":GOSUB
2370
430 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2370
440 W$="/L"+XO$+NA$+CY$+",A":GOSUB 2220
450 W$="!":GOSUB 2370
460 W$="/UR"+STR$(9+2*LPR)+":S"+STR$(9+3*LPR):GOSUB 2220
470 W$="/UY"+STR$(9+2*LPR)+":AD"+STR$(9+3*LPR):GOSUB 2220
480 W$="/CG"+STR$(9+2*LPR)+":H"+STR$(9+3*LPR)+",AC"+STR$(9+2*LPR)+",V":GOSUB
2220
490 W$="/UAC"+STR$(9+2*LPR)+":AD"+STR$(9+3*LPR):GOSUB 2220
500 DIM SUP$(7,1),DEM$(7,1)
510 FOR I=1 TO LPR 'MAJOR LOOP GOING THROUGH PRODUCTS
520 OFILE2$=XO$+"S"+RIGHT$(STR$(I),LEN(STR$(I))-1)+".PRN"
530 OFILE3$=XO$+"D"+RIGHT$(STR$(I),LEN(STR$(I))-1)+".PRN"
540 OPEN"I",2,OFILE2$
550 J1=0
560 IF EOF(2) THEN GOTO 600 'READ IN SUPPLY ELASTICITIES FOR PRODUCT I
570 J1=J1+1
580 LINE INPUT #2,W$:SUP$(J1,1)=W$
590 GOTO 560
600 CLOSE 2
610 OPEN"I",2,OFILE3$
620 J1=0
630 IF EOF(2) THEN GOTO 670 'READ IN SUPPLY ELASTICITIES FOR PRODUCT I
640 J1=J1+1
650 LINE INPUT #2,W$:DEM$(J1,1)=W$
660 GOTO 630
670 CLOSE 2
680 SI$=RIGHT$(STR$(I+2*LPR+8),LEN(STR$(I+2*LPR+8))-1)
690 FOR J=1 TO LPR +LG 'CHECK TO SEE IF PRODUCT ROW HAS ANY ELASTICITIES
700 J2=FIX((J-1)/22)+1
710 J3=J-(J2-1)*22
720 IF MID$(SUP$(J2,1),(J3-1)*6+4,3)<>"   " THEN 750
730 NEXT J
740 GOTO 1950
750 W$="=Y"+SI$:GOSUB 2220 'SUPPLY CROSS EFFECT
760 W$="1*":WO$="1*"
770 FOR J=1 TO LPR +LG
780 J2=FIX((J-1)/22)+1
790 J3=J-(J2-1)*22
800 IF VAL(MID$(SUP$(J2,1),(J3-1)*6+3,4))=0 OR I=J THEN 1120
810 IF J<=LPR THEN J1=J ELSE J1=SUPQT(J-LPR)
820 SJ$=RIGHT$(STR$(J1+2*LPR+8),LEN(STR$(J1+2*LPR+8))-1)
830 IF J<=LPR THEN 890
840 IF LEN(W$)>230 THEN 850 ELSE 870
850 WO$=WO$+"AD"+SJ$+"^"+MID$(SUP$(J2,1),(J3-1)*6+2,5)+"*"
860 GOTO 880
870 W$=W$+"AD"+SJ$+"^"+MID$(SUP$(J2,1),(J3-1)*6+2,5)+"*"
880 GOTO 1120
890 COLWX$="W" 'SELECT SUPPLY PRICE FOR SUPPLY EQUATION CROSS PRICE
900 FOR I1=1 TO IINPTU 'CHECK IF DEMAND PRICE SHOULD BE USED FOR INPUT
910 IF PRD$(0,I)=INPTU$(0,I1) THEN 940
920 NEXT I1
930 GOTO 990
940 FOR J11=1 TO IINPT
950 IF PRD$(0,J)=INPT$(0,J11) THEN 1070
960 NEXT J11
970 GOTO 990
980 COLWX$="X" 'SELECT DEMAND PRICE FOR FEED INPUT IN FEED USER EQUATION
990 FOR I1=1 TO IDNPT 'CHECK IF DEMAND PRICE USED FOR INTERMEDIATE INPUT
1000 IF PRD$(0,I)=DNPT$(0,I1) THEN 1030
1010 NEXT I1
1020 GOTO 1080
1030 FOR J11=1 TO IDNPTU
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```
1040 IF PRD$(0,J)=DNPTU$(0,J11) THEN 1070
1050 NEXT J11
1060 GOTO 1080
1070 COLWX$="X" 'SELECT DEMAND PRICE FOR FEED INPUT IN FEED USER SUPPLY EQUATION
1080 IF LEN(W$)>230 THEN 1090 ELSE 1110
1090 WO$=WO$+COLWX$+SJ$+"^"+MID$(SUP$(J2,1),(J3-1)*6+2,5)+"*"
1100 GOTO 1120
1110 W$=W$+COLWX$+SJ$+"^"+MID$(SUP$(J2,1),(J3-1)*6+2,5)+"*"
1120 NEXT J
1130 IF LEN(W$)<>0 THEN W$=LEFT$(W$,LEN(W$)-1)
1140 GOSUB 2220
1150 IF LEN(WO$)<>0 THEN WO$=LEFT$(WO$,LEN(WO$)-1)
1160 W$="=R"+SI$:GOSUB 2220:W$=WO$:GOSUB 2220
1170 W$="=Z"+SI$:GOSUB 2220 'DEMAND CROSS EFFECT
1180 W$="1*":WO$="1*":WPRJ$="1*"
1190 FOR J=1 TO LPR + LF
1200 J2=FIX((J-1)/22)+1
1210 J3=J-(J2-1)*22
1220 IF VAL(MID$(DEM$(J2,1),(J3-1)*6+3,4))=0 OR I=J THEN 1470
1230 IF J<=LPR THEN J1=J ELSE J1=DEMQT(J-LPR)
1240 SJ$=RIGHT$(STR$(J1+2*LPR+8),LEN(STR$(J1+2*LPR+8))-1)
1250 IF J<=LPR THEN 1270
1260 WPRJ$=WPRJ$+"((1+L"+SJ$+")^"+MID$(DEM$(J2,1),(J3-1)*6+2,5)+")*"
1270 IF J<=LPR THEN 1330
1280 IF LEN(W$)>230 THEN 1290 ELSE 1310
1290 WO$=WO$+"AC"+SJ$+"^"+MID$(DEM$(J2,1),(J3-1)*6+2,5)+"*"
1300 GOTO 1320
1310 W$=W$+"AC"+SJ$+"^"+MID$(DEM$(J2,1),(J3-1)*6+2,5)+"*"
1320 GOTO 1470
1330 COLWX$="X" 'SELECT SUPPLY PRICE FOR DEMAND CROSS EFFECTS
1340 FOR I1=1 TO IDNPTU 'CHECK IF SUPPY PRICE SHOULD BE USED FOR INTERMEDIATE
DEMAND
1350 IF PRD$(0,I)=DNPTU$(0,I1) THEN 1380
1360 NEXT I1
1370 GOTO 1430
1380 FOR J11=1 TO IDNPT
1390 IF PRD$(0,J)=DNPT$(0,J11) THEN 1420
1400 NEXT J11
1410 GOTO 1430
1420 COLWX$="W" 'SELECT SUPPLY PRICE
1430 IF LEN(W$)>230 THEN 1440 ELSE 1460
1440 WO$=WO$+COLWX$+SJ$+"^"+MID$(DEM$(J2,1),(J3-1)*6+2,5)+"*"
1450 GOTO 1470
1460 W$=W$+COLWX$+SJ$+"^"+MID$(DEM$(J2,1),(J3-1)*6+2,5)+"*"
1470 NEXT J
1480 IF LEN(W$)<>0 THEN W$=LEFT$(W$,LEN(W$)-1)
1490 GOSUB 2220
1500 W$="=CL"+SI$:GOSUB 2220 'STEP TO PUT DEMAND PROJECTION ADJUSTMENT IN COLUMN
CL
1510 W$="/U"+WW$:GOSUB 2220
1520 W$=LEFT$(WPRJ$,LEN(WPRJ$)-1):GOSUB 2220
1530 W$="/FE"+WW$+",$":GOSUB 2220
1540 W$="/P"+WW$:GOSUB 2220
1550 IF LEN(WO$)<>0 THEN WO$=LEFT$(WO$,LEN(WO$)-1)
1560 W$="=S"+SI$:GOSUB 2220:W$=WO$:GOSUB 2220
1570 W$="=AA"+SI$:GOSUB 2220 'SUPPLY CONST
1580 W$="G"+SI$+"/(Y"+SI$+"*R"+SI$+"*"
1590 I2=FIX((I-1)/22)+1
1600 I3=I-(I2-1)*22
1610 IF VAL(MID$(SUP$(I2,1),(I3-1)*6+3,4))=0 THEN 1630
1620 W$=W$+"(C"+SI$+"^"+MID$(SUP$(I2,1),(I3-1)*6+2,5)+")*"
1630 W$=LEFT$(W$,LEN(W$)-1)
1640 W$=W$+")":GOSUB 2220
1650 W$="=AB"+SI$:GOSUB 2220 'DEMAND CONST
1660 W$="H"+SI$+"/(Z"+SI$+"*S"+SI$+"*"
1670 IF VAL(MID$(DEM$(I2,1),(I3-1)*6+3,4))=0 THEN 1690
1680 W$=W$+"(D"+SI$+"^"+MID$(DEM$(I2,1),(I3-1)*6+2,5)+")*"
1690 W$=LEFT$(W$,LEN(W$)-1)
1700 W$=W$+")":GOSUB 2220
1710 W$="!":GOSUB 2220
1720 W$="/S"+XO$+"TEST,PAA"+STR$(9+2*LPR)+":AB"+SI$
1730 W$="=AC"+SI$:GOSUB 2220 'SUPPLY EQUATION
1740 SUPELAS$=MID$(SUP$(I2,1),(I3-1)*6+2,5)
1750 IF VAL(SUPELAS$)=0 THEN SUPELAS$="0"
1760
W$="(1+L"+SI$+"+AJ1*AO"+SI$+")*AA"+SI$+"*Y"+SI$+"*R"+SI$+"*W"+SI$+"^"+SUPELAS$:G
OSUB 2220
1770 W$="=CZ"+SI$:GOSUB 2220 'SPARE ROW DEPENDENT ONLY, SUPPLY EQUATION FOR
COMODMOD
1780 W$="(1+L"+SI$+"+CY"+SI$+"*CR"+SI$+")*AA"+SI$+"*Y"+SI$+"*R"+SI$+"*W"+SI$+"^"
1790 W$=W$+SUPELAS$
1800 GOSUB 2220
1810 W$="=CY"+SI$:GOSUB 2220 '1 FOR LIB. IN COMODMOD
1820 W$="0":GOSUB 2220 '1 FOR LIB. IN COMODMOD
1830 W$="=AD"+SI$:GOSUB 2220 'DEMAND EQUATION
1840 DEMELAS$=MID$(DEM$(I2,1),(I3-1)*6+2,5)
1850 IF VAL(DEMELAS$)=0 THEN DEMELAS$="0"
1860 W$="(1+M"+SI$+")*AB"+SI$+"*Z"+SI$+"*S"+SI$+"*X"+SI$+"^"+DEMELAS$:GOSUB 2220
1870 FOR I1=1 TO INTRD 'ADJUST  NON-TRADED PSE BY NTSSSHIFT AND REMOVE CSE
1880 IF PRD$(0,I)=NTRD$(0,I1) THEN 1910
1890 NEXT I1
1900 GOTO 1950
1910 W$="=AN"+SI$:GOSUB 2220:W$="/U":GOSUB 2220
1920 W$="("+DEMELAS$+"*AK"+SI$+"*(D"+SI$+"+AK"+SI$+")/("
1930 W$=W$+SUPELAS$+"*(D"+SI$+"+"+DEMELAS$+"*AK"+SI$+")))":GOSUB 2220
1940 W$="/P":GOSUB 2220:W$="!":GOSUB 2220
1950 NEXT I
1960 W$="!":GOSUB 2220
1970 W$="/S"+XO$+"TEST,PVAA"+STR$(9+2*LPR)+":AB"+SI$
1980 GOSUB 2220
1990
W$="/L"+XO$+"TEST,PAA"+STR$(9+2*LPR)+":AB"+SI$+",AA"+STR$(9+2*LPR)+",V":GOSUB
2220
2000 W$="!":GOSUB 2220
```

```
2010 SO$=STR$(9+2*LPR)
2020 W$="=A1":GOSUB 2220
2030 W$="/PR"+SO$+":S"+SI$:GOSUB 2220
2040 W$="/PY"+SO$+":AD"+SI$:GOSUB 2220
2050 W$="/S"+XO$+CY$+",OA":GOSUB 2220 'SAVE SPREADSHEET WITH EQUATIONS
2060 W$="=A2":GOSUB 2220
2070 W$="RONINGEN"
2080 GOSUB 2220
2090 W$="/RA2:A2,R"+SO$+":AD"+SO$:GOSUB 2220
2100 W$="/RR"+SO$+":AD"+SO$+",R"+SO$+":R"+SI$:GOSUB 2220
2110 W$="/OCAC"+SO$+":AC"+SI$+",D"+XO$+"SUPPLYEQ":GOSUB 2220
2120 W$="/OCAD"+SO$+":AD"+SI$+",D"+XO$+"DEMANDEQ":GOSUB 2220
2130 W$="/OCR"+SO$+":R"+SI$+",D"+XO$+"SCROSSO":GOSUB 2220
2140 W$="/OCS"+SO$+":S"+SI$+",D"+XO$+"DCROSSO":GOSUB 2220
2150 W$="/OCY"+SO$+":Y"+SI$+",D"+XO$+"SCROSS":GOSUB 2220
2160 W$="/OCZ"+SO$+":Z"+SI$+",D"+XO$+"DCROSS":GOSUB 2220
2170 W$="{BEEP 2}":GOSUB 2370
2180 W$="/Q,Y":GOSUB 2220
2190 CLOSE 1
2200 SYSTEM
2210 END
2220 LL=INSTR(W$," ") 'SUBROUTINE TO REMOVE BLANKS AND WRITE OUT STRING
2230 IF LL=0 THEN 2250
2240 W$=LEFT$(W$,LL-1)+RIGHT$(W$,LEN(W$)-LL):GOTO 2220
2250 IF LEFT$(W$,1)="/" THEN GOTO 2320
2260 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2270 IF LEFT$(W$,1)="!" THEN PRINT #1,"{RECALC
T";STR$(9+2*LPR);":";WW$;",1}":RETURN
2280 PP$="{LETC "+WW$+","+CHR$(34)+W$+CHR$(34)+"}"
2290 IF LEN(PP$)<132 GOTO 2310
2300 PRINT #1,"=";WW$;"~":PRINT #1,W$;"~":PRINT #1,"=A1~":RETURN
2310 PRINT #1,PP$:RETURN
2320 PRINT #1,W$;WSQ$:RETURN
2330 IF LEFT$(W$,1)="/" THEN GOTO 2370
2340 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2350 IF LEFT$(W$,1)="!" THEN PRINT #1,"{RECALC
T";STR$(9+2*LPR);":";WW$;",1}":RETURN
2360 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2370 PRINT #1,W$;WSQ$:RETURN 'PRINT WITH BLANKS
2380 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$

10 REM - EQNC - PART C, CREATE PRODUCER, CONSUMER SURPLUS AND OTHER WELFARE
20 REM MEASURES FOR CONSTANT ELASTICITY SUPPLY DEMAND SYSTEM
30 CLS 'A COUNTRY/REGION IS SELECTED AND AN XQT FILE OF EQUATIONS IS CREATED
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 OFILE$=XO$+"TEST.TXT"
70 OPEN"I",1,OFILE$
80 DIM SUPQT(123),DEMQT(123)
90 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
100  CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
110  CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
120  CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
130  LCL=LEN(CL$)/2
140  DIM CLM$(0,254) '254 COLUMNS MAXIMUM
150  FOR I=1 TO LCL
160  CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
170  CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
180  CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
190  CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
200  CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
210  LCLL=LEN(CL$)/2
220  FOR I=1 TO LCLL
230  CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
240  CL$=""
250 INPUT #1,CY$:
260 INPUT #1,LPR
270 INPUT #1,LG
280 FOR I=1 TO LG
290 INPUT #1,SUPQT(I):NEXT I
300 INPUT #1,LF
310 FOR I=1 TO LF
320 INPUT #1,DEMQT(I):NEXT I
330 DIM PRM$(0,123)
340 FOR I=1 TO LPR
350 INPUT #1,PRM$(0,I):NEXT I
360 PRINT:PRINT"Doing welfare stuff for model country spreadsheet --->
";CY$:PRINT
370 CLOSE 1
380 OFILE$=XO$+"TEST.XQT"
390 OPEN"O",1,OFILE$
400 W$="{MACRO}":GOSUB 2420
410 W$="{WINDOWSOFF}":GOSUB 2370
420 W$="{PANELOFF}":GOSUB 2370
430 W$="{STATUS "+CHR$(34)+"Writing indicators for: "+CY$+CHR$(34)+"}":GOSUB
2370
440 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2370
450 W$="/L"+XO$+NA$+CY$+",A":GOSUB 2300
460 W$="!":GOSUB 2370
470 DIM SCR$(0,123),DCR$(0,123),SUPEQ$(0,123),DEMEQ$(0,123),SHR$(0,123)
480 OFILE$=XO$+"SCROSS.PRN"
490 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
500 FOR I=1 TO LPR:LINE INPUT
#2,W$:SCR$(0,I)=RIGHT$(W$,LEN(W$)-INSTR(W$,"=")):NEXT I:CLOSE 2
510 OFILE$=XO$+"DCROSS.PRN"
520 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
530 FOR I=1 TO LPR:LINE INPUT
#2,W$:DCR$(0,I)=RIGHT$(W$,LEN(W$)-INSTR(W$,"=")):NEXT I:CLOSE 2
540 OFILE$=XO$+"SCROSSO.PRN"
550 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
560 FOR I=1 TO LPR:LINE INPUT
#2,W$:W$=RIGHT$(W$,LEN(W$)-INSTR(W$,"=")):SCR$(0,I)=SCR$(0,I)+W$+" ":NEXT
I:CLOSE 2
```

```
570 OFILE$=XO$+"DCROSSO.PRN"
580 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
590 FOR I=1 TO LPR:LINE INPUT
#2,W$:W$=RIGHT$(W$,LEN(W$)-INSTR(W$,"=")):DCR$(0,I)=DCR$(0,I)+W$+" ":NEXT
I:CLOSE 2
600 OFILE$=XO$+"SUPPLYEQ.PRN"
610 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
620 FOR I=1 TO LPR:LINE INPUT #2,SUPEQ$(0,I):NEXT I:CLOSE 2
630 OFILE$=XO$+"DEMANDEQ.PRN"
640 OPEN"I",2,OFILE$:LINE INPUT #2,W$:LINE INPUT #2,W$
650 FOR I=1 TO LPR:LINE INPUT #2,DEMEQ$(0,I):NEXT I:CLOSE 2
660 REM
670 REM SET CALC$=L IF LINEAR WELFARE APPROX. DESIRED. DEFAULT IS CALC$=C, A
CONSTANT ELASTICITY CALCULATION
680 REM
690 CALC$="C" 'C IF CONSTANT ELAST. CALC., L IF LINEAR APPROX.
700 REM
710 PTOP$=STR$(2*LPR+7):PTOP$=RIGHT$(PTOP$,LEN(PTOP$)-1) 'POS. FOR MIN. PRICE AS
SHARE OF PRODUCER PRICE
720 W$="=BA"+PTOP$:GOSUB 2300:GOSUB 2380:W$="MPRICESH>":GOSUB 2300:GOSUB 2390
730 REM
740 REM STATEMENT BELOW SETS LOWER PRICE BOUND FOR PRODUCER SURPLUS CALCULATION
750 REM VALUE OF 0 SETS BOUND AT 0 WHILE A VALUE OF 1 SETS IT AT THE LOWEST OLD
760 REM OR NEW PRODUCER PRICE.  THE BOUND MUST BE BETWEEN 0 AND 1.  .5 IS THE
770 REM DEFAULT VALUE FOR MPRICESH
780 REM
790 W$="=BB"+PTOP$:GOSUB 2300:GOSUB 2380:W$=".5":GOSUB 2300 'BOUND SET AT
DEFAULT OF .5
800 REM
810 FSHRC$=CLM$(0,LPR+LF+4) 'INPUT SHARE SUM COLUMN
820 OSHRC$=CLM$(0,LPR+LF+5) 'OTHER DEMAND SHARE COLUMN
830 FOR K=1 TO LPR 'MAIN LOOP FOR WELFARE FORMULA CALCULATIONS
840 IF PRM$(0,K)="**" THEN 850 ELSE 880 'SKIP IF NO PRODUCT
850 PO$=STR$(2*LPR+8+K):PO$=RIGHT$(PO$,LEN(PO$)-1) 'ROW POSITION
860 W$="/B"+PO$:GOSUB 2300 'BLANK OUT ANY UNWANTED STUFF
870 GOTO 2020
880 IF INSTR(SUPEQ$(0,K),"RONINGEN")=0 THEN 890 ELSE 2020
890 PO$=STR$(2*LPR+8+K):PO$=RIGHT$(PO$,LEN(PO$)-1) 'ROW POSITION
900 FSHRR$=STR$(LPR+5+K):FSHRR$=RIGHT$(FSHRR$,LEN(FSHRR$)-1) ' ROW POSITION OF
INPUT AND OTHER DEMAND SHARES
910 W$="=BB"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400:Y$="BB"+PO$ 'CHANGE IN
PRODUCER SURPLUS
920 IF CALC$="L" THEN 970
930
EL$=RIGHT$(SUPEQ$(0,K),LEN(SUPEQ$(0,K))-INSTR(SUPEQ$(0,K),"^")):IELAS=(CINT((1+V
AL(EL$))*100))/100:EL1$=STR$(IELAS)  'FIND OWN PRICE ELASTICITY
940
W$="(.001/("+EL1$+"*F"+PO$+"))*(W"+PO$+"*AC"+PO$+"-((C"+PO$+"+BM"+PO$+"*BK"+PO$
'EXACT CONSTANT ELAS. MEASURE
950 W$=W$+")*G"+PO$+"))"+"+BM"+PO$+"*.001*BK"+PO$+"*G"+PO$+"/F"+PO$
960 GOTO 980
970 W$="(.001/F"+PO$+")*(W"+PO$+"-C"+PO$+")*.5*(AC"+PO$+"+G"+PO$+")" 'LINEAR
APPROX. MEASURE
980 FOR J=1 TO LPR:P$="AC"+PO$:P=INSTR(DCR$(0,J),P$):IF P=0 THEN 1020
990 PE=INSTR(P,DCR$(0,J),"*")-1:IF PE=-1 THEN PE=INSTR(P,DCR$(0,J)," ")-1
1000 S$=MID$(DCR$(0,J),P+LEN(P$)+1,PE-P-LEN(P$)):SHR$(0,J)=SHR$(0,J)+"-"+S$
1010 Y$=Y$+"+"+S$+"*BC"+STR$(2*LPR+8+J)
1020 NEXT J
1030 GOSUB 2300:GOSUB 2390
1040 W$="=CS"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'PARK PRODUCER PRICE MINUS
ACTIVE TAX
1050 W$="C"+PO$+"+BM"+PO$+"*BK"+PO$:GOSUB 2300:GOSUB 2390
1060 W$="=BL"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'MINIMUM ADJUSTED PRODUCER
SURPLUS
1070 YT$="BB"+PO$+"-(.001/("+EL1$+"*F"+PO$+"))*((BB"+PTOP$+"*MIN("
1080 YT$=YT$+"CS"+PO$+",W"+PO$+"))^"+EL1$+")*((AC"+PO$+"/(W"+PO$+"^"+EL$+"))-(G"
1090 YT$=YT$+PO$+"/(CS"+PO$+"^"+EL$+")))"
1100 W$=YT$:GOSUB 2300:GOSUB 2390
1110 W$="=DC"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'MINIMUM ADJUSTED PRODUCER
SURPLUS FOR COMODMOD
1120 YT$="BB"+PO$+"-(.001/("+EL1$+"*F"+PO$+"))*((0.5*MIN("
1130 YT$=YT$+"CS"+PO$+",W"+PO$+"))^"+EL1$+")*((AC"+PO$+"/(W"+PO$+"^"+EL$+"))-(G"
1140 YT$=YT$+PO$+"/(CS"+PO$+"^"+EL$+")))"
1150 W$=YT$:GOSUB 2300
1160 W$="=BC"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'CHANGE IN CONSUMER SURPLUS
1170 IF CALC$="L" THEN 1270
1180
EL$=RIGHT$(DEMEQ$(0,K),LEN(DEMEQ$(0,K))-INSTR(DEMEQ$(0,K),"^")):IELAS=(CINT((1+V
AL(EL$))*100))/100:EL1$=STR$(IELAS)  'FIND OWN PRICE ELASTICITY
1190 W$="(-.001/("+EL1$+"*F"+PO$+"))*(X"+PO$+"*AD"+PO$+"-(D"+PO$+"*H"+PO$+")"
'EXACT CONSUMER SURPLUS CALCULATION
1200 W$=W$+"-((MAX(D"+PO$+",X"+PO$+"))^"+EL1$+")"
1210 W$=W$+"*((AD"+PO$+"/(X"+PO$+"^"+EL$+"))-(H"+PO$+"/(D"+PO$+"^"+EL$+")))"
1220
Z$="(-.001/F"+PO$+")*((X"+PO$+"*AD"+PO$+"*LN(X"+PO$+"))-(D"+PO$+"*H"+PO$+"*LN(D"
+PO$+"))" 'CALC. IF ELAS. =-1
1230 Z$=Z$+"-(LN(MAX(D"+PO$+",X"+PO$+"))"
1240 Z$=Z$+"*(X"+PO$+"*AD"+PO$+"-D"+PO$+"*H"+PO$+")))"
1250 IF VAL(EL$)=-1 THEN W$=Z$
1260 GOTO 1280
1270 W$="(-.001/F"+PO$+")*(X"+PO$+"-D"+PO$+")*.5*(AD"+PO$+"+H"+PO$+")" 'LINEAR
APPROX. MEASURE
1280 GOSUB 2300:GOSUB 2390
1290 W$="=BF"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'CHANGE IN GOVERNMENT
EXPENDITURES
1300 W$="-.001*(BM"+PO$+"*AZ"+PO$+"*G"+PO$+"+BN"+PO$+"*BA"+PO$+"*H"+PO$
1310 W$=W$+"+BO"+PO$+"*CA"+PO$+"*BR"+PO$+"+BP"+PO$+"*CB"+PO$+"*BQ"+PO$+")"
1320 GOSUB 2300:GOSUB 2390
1330 W$="=DA"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'CHANGE IN GOVERNMENT
EXPENDITURES FOR COMODMOD
1340 W$="-.001*(CY"+PO$+"*AZ"+PO$+"*G"+PO$+"+CY"+PO$+"*BA"+PO$+"*H"+PO$
1350 W$=W$+"+CY"+PO$+"*CA"+PO$+"*BR"+PO$+"+CY"+PO$+"*CB"+PO$+"*BQ"+PO$+")"
1360 GOSUB 2300
1370 W$="=BH"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'CHANGE IN TOTAL WELFARE
```

```
1380 W$="BL"+PO$+"+BC"+PO$+"-BF"+PO$+"-BG"+PO$+"+BJ"+PO$:GOSUB 2300:GOSUB 2390
1390 W$="=BI"+PO$:GOSUB 2300:GOSUB 2380 'CALCULATE MARKET PRICE
1400 GOSUB 2400
1410 W$="E"+PO$+"*(1+AT"+PO$+"/100)+(1-BM"+PO$+")*CT"+PO$:GOSUB 2300:GOSUB 2390
1420 W$="=BJ"+PO$:GOSUB 2300:GOSUB 2380 'CALCULATE CHANGE IN RENT VALUE
1430 GOSUB 2400
1440 W$="(((1-J"+PO$+"*K"+PO$+")*(B"+PO$+"-BU"+PO$+")+(1-BN"+PO$+")*(AK"+PO$
1450
W$=W$+"-BA"+PO$+")*IF((AE"+PO$+"/(I"+PO$+"+.001))<0,0,1))*.001*AE"+PO$+")-CG"+PO
$
1460 GOSUB 2300:GOSUB 2390
1470 W$="=BG"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'NEW GOVERNMENT EXPENDITURE
FROM PARTIAL LIBERALIZATION OF SUPPORT
1480 W$=".001*((1-BM"+PO$+")*AZ"+PO$+"*AO"+PO$+"+(1-BN"+PO$+")*BA"+PO$+"*AP"+PO$
1490 W$=W$+"+(1-BO"+PO$+")*(CA"+PO$+"*CD"+PO$+")"
1500 W$=W$+"+(1-BP"+PO$+")*(CB"+PO$+"*CC"+PO$+"))+CQ"+PO$
1510 GOSUB 2300:GOSUB 2390
1520 W$="=DB"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'NEW GOVERNMENT EXPENDITURE
FROM PARTIAL LIBERALIZATION OF SUPPORT FOR COMODMOD
1530 W$=".001*((1-CY"+PO$+")*AZ"+PO$+"*AO"+PO$+"+(1-CY"+PO$+")*BA"+PO$+"*AP"+PO$
1540 W$=W$+"+(1-CY"+PO$+")*(CA"+PO$+"*CD"+PO$+")"
1550 W$=W$+"+(1-CY"+PO$+")*(CB"+PO$+"*CC"+PO$+"))
1560 GOSUB 2300
1570 W$="=BM"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED SHARE OF DPSW
1580 W$="N"+PO$+"/(AJ"+PO$+"+.00001)":GOSUB 2300:W$="/FE,$":GOSUB 2300:GOSUB
2390
1590 W$="=BN"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED SHARE OF CSW
1600 W$="O"+PO$+"/(AK"+PO$+"+.00001)":GOSUB 2300:GOSUB 2410:GOSUB 2390
1610 W$="=BO"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED SHARE OF MSW
1620 W$="P"+PO$+"/(AL"+PO$+"+.00001)":GOSUB 2300:GOSUB 2410:GOSUB 2390
1630 W$="=BP"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED SHARE OF ESW
1640 W$="Q"+PO$+"/(AM"+PO$+"+.00001)":GOSUB 2300:GOSUB 2410:GOSUB 2390
1650 W$="=BS"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED GROSS EXPORTS
1660 W$="MAX(BQ"+PO$+"+AQ"+PO$+"*((BQ"+PO$+"+.5)/(BQ"+PO$+"+BR"+PO$+"+1)),0)"
1670 W$=W$+"-MIN(BR"+PO$+"-AQ"+PO$+"*(BR"+PO$+"+.5)/(BQ"+PO$+"+BR"+PO$+"+1),0)"
1680 GOSUB 2300:GOSUB 2400:GOSUB 2390
1690 W$="=BT"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED GROSS IMPORTS
1700 W$="MAX(BR"+PO$+"-AQ"+PO$+"*((BR"+PO$+"+.5)/(BQ"+PO$+"+BR"+PO$+"+1)),0)"
1710 W$=W$+"-MIN(BQ"+PO$+"+AQ"+PO$+"*(BQ"+PO$+"+.5)/(BQ"+PO$+"+BR"+PO$+"+1),0)"
1720 GOSUB 2300:GOSUB 2400:GOSUB 2390
1730 W$="=BV"+PO$:GOSUB 2300:GOSUB 2380 'BASE NET TRADE VALUE
1740 W$="BU"+PO$+"*I"+PO$+"/1000":GOSUB 2300:GOSUB 2400:GOSUB 2390
1750 W$="=BW"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED NET TRADE VALUE
1760 W$="B"+PO$+"*AE"+PO$+"/1000":GOSUB 2300:GOSUB 2400:GOSUB 2390
1770 W$="=BX"+PO$:GOSUB 2300:GOSUB 2380 'CHANGE IN NET TRADE VALUE
1780 W$="BW"+PO$+"-BV"+PO$:GOSUB 2300:GOSUB 2400:GOSUB 2390
1790 W$="=BY"+PO$:GOSUB 2300:GOSUB 2380 'BASE SELF SUFFICIENCY RATIO
1800 W$="G"+PO$+"/(H"+PO$+"+.000001)":GOSUB 2300:GOSUB 2410:GOSUB 2390
1810 W$="=BZ"+PO$:GOSUB 2300:GOSUB 2380 'LIBERALIZED SELF SUFFICIENCY RATIO
1820 W$="AC"+PO$+"/(AD"+PO$+"+.000001)":GOSUB 2300:GOSUB 2410:GOSUB 2390
1830 W$="=CC"+PO$:GOSUB 2300:GOSUB 2380 'CHANGE IN GROSS EXPORTS
1840 W$="BS"+PO$+"-BQ"+PO$:GOSUB 2300:GOSUB 2400:GOSUB 2390
1850 W$="=CD"+PO$:GOSUB 2300:GOSUB 2380 'CHANGE IN GROSS IMPORTS
1860 W$="BT"+PO$+"-BR"+PO$:GOSUB 2300:GOSUB 2400:GOSUB 2390
1870 W$="=CE"+PO$:GOSUB 2300:GOSUB 2380 '% CHANGE IN GROSS EXPORTS
1880 W$="(BS"+PO$+"-BQ"+PO$+")*100/(BQ"+PO$+"+1)":GOSUB 2300:GOSUB 2410:GOSUB
2390
1890 W$="=CF"+PO$:GOSUB 2300:GOSUB 2380 '% CHANGE IN GROSS IMPORTS
1900 W$="(BT"+PO$+"-BR"+PO$+")*100/(BR"+PO$+"+1)":GOSUB 2300:GOSUB 2410:GOSUB
2390
1910 W$="=CH"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2410 'BASE DEMAND PER CAPITA
1920 W$="1000*H"+PO$+"/(1+X1)":GOSUB 2300:GOSUB 2390
1930 W$="=CI"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2410 'LIBERALIZED DEMAND PER
CAPITA
1940 W$="1000*AD"+PO$+"/(1+(X1*((1+P1)^AG1)))":GOSUB 2300:GOSUB 2390
1950 REM PUT IN SHARE OF 'OTHER' MODEL DEMAND IF NEEDED FOR PROJECTIONS
1960 W$="=CN"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2410
1970 W$="/C"+FSHRC$+FSHRR$+":"+FSHRC$+FSHRR$+",CN"+PO$+",V":GOSUB 2300
1980 GOSUB 2390
1990 W$="=CO"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2410
2000 W$="/C"+OSHRC$+FSHRR$+":"+OSHRC$+FSHRR$+",CO"+PO$+",V":GOSUB 2300
2010 GOSUB 2390
2020 NEXT K
2030 FOR K=1 TO LPR 'SECOND LOOP TO ADJUST CONSUMER SURPLUS
2040 IF PRM$(0,K)="**" THEN 2210 'SKIP IF NO PRODUCT
2050 IF INSTR(SUPEQ$(0,K),"RONINGEN")=0 THEN 2060 ELSE 2210
2060 PO$=STR$(2*LPR+8+K):PO$=RIGHT$(PO$,LEN(PO$)-1)
2070 Y$="BC"+PO$
2080 IF INSTR(SHR$(0,K),"-")=0 THEN 2090 ELSE Y$=Y$+"*(1"+SHR$(0,K)+")"
2090 REM W$="=BE"+PO$:GOSUB 1820:GOSUB 1860 'ADJUSTED CONSUMER SURPLUS
2100 REM W$=Y$:GOSUB 1820:GOSUB 1870
2110 W$="=BD"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'GDP VALUE
2120 W$="B"+PO$+"*AC"+PO$+"*(1-CN"+PO$+"-CO"+PO$+")/1000":GOSUB 2300:GOSUB
2400:GOSUB 2390
2130 W$="=BE"+PO$:GOSUB 2300:GOSUB 2380:GOSUB 2400 'FARM VALUE (USING MKPRICE)
2140 W$="BI"+PO$+"*AC"+PO$+"/1000":GOSUB 2300:GOSUB 2400:GOSUB 2390
2150 W$="=CJ"+PO$:GOSUB 2300:GOSUB 2380 'BASE PROD. VALUE (INCLUDES TRANSFERS)
2160 W$="C"+PO$+"*G"+PO$+"/1000":GOSUB 2300:GOSUB 2400:GOSUB 2390
2170 W$="=CK"+PO$:GOSUB 2300:GOSUB 2380 'VALUE OF PRODUCER SUPPORT
2180
W$=".001*AC"+PO$+"*((1-AJ1)*AJ"+PO$+"-(1-AL1)*AL"+PO$+"+(1-AM1)*AM"+PO$+")":GOSU
B 2300:GOSUB 2400:GOSUB 2390
2190 W$="=CU"+PO$:GOSUB 2300:GOSUB 2380 'BASE CONS. VALUE (INCLUDES TRANSFERS)
2200 W$="D"+PO$+"*H"+PO$+"/1000":GOSUB 2300:GOSUB 2400:GOSUB 2390
2210 NEXT K
2220 W$="=A1":GOSUB 2370
2230 W$="!":GOSUB 2370
2240 W$="/S"+XO$+CY$+",OA":GOSUB 2300 'SAVE SPREADSHEET WITH EQUATIONS
2250 W$="{BEEP 3}":GOSUB 2370
2260 W$="/Q,Y":GOSUB 2370
2270 CLOSE 1
2280 SYSTEM
2290 END
2300 LL=INSTR(W$," ") 'SUBROUTINE TO REMOVE BLANKS AND WRITE OUT STRING
```

```
2310 IF LL=0 THEN 2330
2320 W$=LEFT$(W$,LL-1)+RIGHT$(W$,LEN(W$)-LL):GOTO 2300
2330 IF LEFT$(W$,1)="/" THEN GOTO 2370
2340 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2350 IF LEFT$(W$,1)="!" THEN PRINT #1,"{RECALC ";WW$;",1}":RETURN
2360 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2370 PRINT #1,W$;WSQ$:RETURN
2380 W$="/U"+WW$:PRINT #1,W$;WSQ$:RETURN
2390 W$="/P"+WW$:PRINT #1,W$;WSQ$:RETURN
2400 W$="/FE"+WW$+",I":PRINT #1,W$;WSQ$:RETURN
2410 W$="/FE"+WW$+",$":PRINT #1,W$;WSQ$:RETURN
2420 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
```

Now, all of the programs have been listed which create or modify spreadsheet components of a model. The next program is WORLDMOD which assembles the pieces of a world model into one spreadsheet and links them together with a world market clearing mechanism. WORLDMOD creates a multi-product multi-country world model. Several options are available for holding countries or products constant in the world model. Differently specified world models can be given different marking characters. An alternative to a multi-product world model is to use COMODMOD to create a single product multi-country world model.

SWOPSIM Program	
WORLDMOD	Program to create a world multi-product multi-country world model from country/region model spreadsheets in the model subdirectory, C:\NAME. The country spreadsheets should be fully completed and initialized.
REQUIREMENTS	The C:\NAME subdirectory must contain initalized country/ region spreadsheets for all countries in the model NAME.
OUTPUT (D:)	A NAMEWDMC.CAL world model spreadsheet with the first page containing the world market clearing mechanism and subsequent pages containing country model equations and variables that can be used to apply policy and other economic shocks to the world model. MC is an optional (2 digit or less) Model Code that can name a world model. If MC is not entered, the model name will be NAMEWD.
COMMAND	WORLDMOD NAME MC

```
:WORLDMOD
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO ------------------------------------------------------------------------
ECHO WORLDMOD       Program to create a world multi-product multi-country
ECHO                world model from country/region model spreadsheets
ECHO                in the model subdirectory, C:\NAME.  The country
ECHO                spreadsheets should be fully completed and initialized.
ECHO REQUIREMENTS   The C:\NAME subdirectory must contain initalized country/
ECHO                region spreadsheets for all countries in the model NAME.
ECHO OUTPUT (D:)    A NAMEWDMC.CAL world model spreadsheet with the first page
ECHO                containing the world market clearing mechanism and
ECHO                subsequent pages containing country model equations and
ECHO                variables that can be used to apply policy and other
ECHO                economic shocks to the world model.  MC is an optional
ECHO                (2 digit or less) Model Code that can name a world model.
ECHO                If MC is not entered, the model name will be NAMEWD.
ECHO ------------------------------------------------------------------------
ECHO COMMAND        WORLDMOD  NAME MC
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: WORLDMOD NAME
IF FILE%1 == FILE GOTO END
IF EXIST C:\%1\%1bRW.CAL GOTO C1
ECHO ERROR = C:\%1\%1bRW.CAL does not exist
GOTO END
:C1
COPY C:\%1\%1.PRN D:
ECHO %1, %2, >D:WORLDMOD.TXT
IF EXIST D:*.CAL ERASE D:*.CAL
C:\SWOPSIM\WORLDMOD
CALL C:SC D:TEST
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
IF EXIST D:%1.PRN ERASE D:%1.PRN
IF EXIST D:WORLDMOD.TXT ERASE D:WORLDMOD.TXT
CLS
DIR D:%1WD%2.CAL/W
:END ECHO ON
```

```
10 REM - WORLDMOD - CREATE WORLD PRODUCT MODEL SPREADSHEET FROM COUNTRY/REGION
SPREADSHEETS; AN INDICATOR (+WELFARE MEASURES) FILE IS ALSO CREATED FOR SC3,4
20 REM COUNTRY/REGION SPREADSHEETS MUST HAVE PRICE AND QUANTITY BASE DATA ADDED
TO THEM BEFORE THIS PROGRAM IS RUN
30 CLS 'WORLD FILE IS CREATED FROM COUNTRY/REGION FILES
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 PRINT"Program to create a world multi-region multi-product model spreadsheet"
70 PRINT"from country/region spreadsheets.  The spreadsheets must contain base"
80 PRINT"data, elasticities, and equations before the world model is"
90 PRINT"created with this program.":PRINT
100 OFILE$=XO$+"WORLDMOD.TXT"
110 OPEN"I",1,OFILE$:INPUT #1,FILE$,WDN$:CLOSE 1 'READ MODEL CODE
120 NAM$=FILE$+"b"
130 IF LEN(WDN$)>2 THEN WDN$=LEFT$(WDN$,2)
140 PRINT:PRINT"Reading master file - ";FILE$:PRINT
150 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN ABOUT UP TO 250 PRODUCT GROUPS
160 DIM PRMO(200) 'VECTOR OF CODES TO OMIT PRODUCT FROM WORLD MODEL (0=OMIT)
170 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
180 DIM CYMO(42) 'VECTOR OF CODES TO OMIT COUNTRY/REGION MODEL (0=OMIT)
190 DIM NTRD(123) ' VECTOR OF 0'S FOR TRADED AND 1'S FOR NON-TRADED PRODUCTS
200 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
210 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
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220 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
230 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
240 LCL=LEN(CL$)/2
250 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
260 FOR I=1 TO LCL
270 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
280 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
290 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
300 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
310 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
320 LCLL=LEN(CL$)/2
330 FOR I=1 TO LCLL
340 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
350 CL$=""
360 OFILE$=XO$+FILE$+".PRN"
370 OPEN"I",1,OFILE$
380 DIM D(123,42)
390 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
400 LINE INPUT #1,W$
410 LINE INPUT #1,W$
420 LINE INPUT #1,W$
430 LINE INPUT #1,CY$
440 LINE INPUT #1,W$
450 STAR=(INSTR(CY$,"-")-11)/3
460 LCY=(LEN(CY$)-8)/3
470 IF STAR < LCY THEN LCY=STAR
480 PRINT:PRINT"Countries/regions are:":PRINT
490 FOR I=1 TO LCY
500 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
510 LPR=0
520 PRINT:PRINT:PRINT"Product groups are:":PRINT
530 LPR=LPR+1
540 LINE INPUT#1,W$
550 WP$=MID$(W$,5,4)
560 NTRD(LPR)=0:IF MID$(W$,LCY*3+16,2)="NT" THEN NTRD(LPR)=1
570 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 590
580 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 570
590 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 670 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
600 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
610 X$=MID$(W$,(J-1)*3+9,3)
620 IF X$="  D" THEN X$="  2"
630 IF X$="  S" THEN X$="  3"
640 IF X$=" SD" OR X$=" DS" THEN X$="  4"
650 D(LPR,J)=VAL(X$):NEXT J
660 GOTO 530
670 CLOSE 1
680 LPR=LPR-1
690 PRINT
700 REM SET RIGHTMOST COLUMN IN INDICATOR SET HERE
710 RCOLUMN$="CU" 'SET RIGHTMOST COLUMN IN INDICATORS TO CU
720 PRINT:PRINT"Rightmost column is ";RCOLUMN$
730 INDOMIT$="" 'NOT USED - INDICATORS NOW PUT ON SEPARATE FILE
740 FOR K=1 TO LCY:CYMO(K)=1:NEXT K ' FILL WITH CODES (1's) TO KEEP
COUNTRY/REGIONS
750 PRINT:PRINT:INPUT"Hold any country/region constant (Y or N
(default))";ROMIT$ 'LOOP TO OMIT COUNTRY/REGIONS BY KEEPING QUANTITIES CONSTANT
760 IF LEFT$(ROMIT$,1)="Y" THEN 770 ELSE 900
770 PRINT:PRINT"Countries/regions are:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
780 PRINT:INPUT"Country/region to hold constant (hit Enter to continue)";ROMIT$
790 IF ROMIT$="RW" THEN PRINT:PRINT"RW not permitted": ROMIT$="":GOTO 780
800 IF ROMIT$="" THEN 850
810 FOR KK=1 TO LCY:IF CYM$(0,KK)=ROMIT$ THEN 840
820 NEXT KK
830 GOTO 780
840 CYMO(KK)=0:ROMIT$="":GOTO 780
850 CLS:PRINT"Countries/regions are:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
860 PRINT:PRINT"You have held constant: ":PRINT:FOR K=1 TO LCY:IF CYMO(K)=0 THEN
PRINT CYM$(0,K);" ";
870 NEXT K
880 PRINT:PRINT:INPUT"OKAY (Y OR N)";ROMIT$
890 IF LEFT$(ROMIT$,1)="N" THEN GOTO 740
900 FOR I=1 TO LPR:PRMO(I)=1:NEXT I 'LOOP TO INCLUDE ALL PRODUCT GROUPS
910 PRINT:PRINT:INPUT"Hold constant any product groups (Y or N
(default))";ROMIT$ 'LOOP TO HOLD PRODUCT GROUPS CONSTANT IN WORLD MODEL
920 IF LEFT$(ROMIT$,1)="Y" THEN 930 ELSE 1060
930 CLS:PRINT:PRINT"Product groups are:":PRINT:FOR I=1 TO LPR:PRINT PRM$(0,I);"
";:NEXT I:PRINT
940 PRINT:PRINT"You have held constant:":PRINT:FOR I=1 TO LPR:IF PRMO(I)=0 THEN
PRINT PRM$(0,I);" ";
950 NEXT I:PRINT
960 PRINT:INPUT"Product group to hold constant (hit 'Enter' to continue)";ROMIT$
970 IF ROMIT$="" THEN 1010
980 FOR I=1 TO LPR:IF PRM$(0,I)=ROMIT$ THEN 1000
990 NEXT I:GOTO 960
1000 PRMO(I)=0:ROMIT$="":GOTO 930
1010 CLS:PRINT"Product groups are:":PRINT:FOR I=1 TO LPR:PRINT PRM$(0,I);"
";:NEXT I:PRINT
1020 PRINT:PRINT"You have held constant:":PRINT:FOR I=1 TO LPR:IF PRMO(I)=0 THEN
PRINT PRM$(0,I);" ";
1030 NEXT I
1040 PRINT:PRINT:INPUT"Okay (Y or N)";ROMIT$
1050 IF LEFT$(ROMIT$,1)="N" THEN GOTO 900
1060 OFILE$=XO$+"TEST.XQT":OPEN"O",1,OFILE$
1070 W$="{MACRO}":GOSUB 2390
1080 REM W$="{WINDOWSOFF}":GOSUB 4810
1090 W$="{PANELOFF}":GOSUB 2380
1100 W$="{STATUS "+CHR$(34)+"Creating SWOPSIM world model -->
"+FILE$+CHR$(34)+"}":GOSUB 2380
1110 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.,
56568"+CHR$(34)+"}":GOSUB 2380
1120 W$="/TV":GOSUB 2280
```

```
1130 W$="=A1":GOSUB 2280:W$=FILE$+"WD":GOSUB 2270
1140 W$="/FCA,TC":GOSUB 2280
1150 NAMM$=FILE$
1160 CLS:PRINT:PRINT"Writing macro '.xqt' commands to create-->
";NAMM$;"WD";WDN$;".CAL ......":PRINT
1170 LBB$=STR$(9+2*LPR):LBE$=STR$(8+3*LPR):LO$=STR$(8+2*LPR)
1180 W$="/IP2:"+STR$(LCY+1):GOSUB 2280
1190 W$="/L"+XI$+FILE$+"\"+NAM$+"RW,PA"+LO$+":B"+LBE$+",A"+LO$:GOSUB 2280
1200 W$="=A"+LO$:GOSUB 2280:GOSUB 2410
1210 W$=FILE$+"WD"+WDN$:GOSUB 2270
1220 W$="=A1":GOSUB 2280
1230 W$="/FR"+LO$+",TR":GOSUB 2280
1240 W$="//SR"+FILE$+"WD"+WDN$:GOSUB 2280
1250 FOR K=1 TO LCY 'LOOP TO ADD EACH COUNTRY/REGION FILE TO WORLD FILE
1260 KP=1:G$=XI$+FILE$+"\":DES$=STR$(6+2*LPR):DESE$=STR$(8+3*LPR)
1270 W$="//SGS"+STR$(K+1):GOSUB 2280
1280 W$="/TV":GOSUB 2280
1290 W$="{STATUS "+CHR$(34)+"Adding ["+NAM$+CYM$(0,K)+"] to SWOPSIM world model
--> "+FILE$+"WD"+WDN$+CHR$(34)+"}":GOSUB 2380
1300 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.,
56568"+CHR$(34)+"}":GOSUB 2380
1310 IF CYMO(K)=0 THEN 1410
1320 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PA1:AN1,A1,V":GOSUB 2280 'LOAD TOP ROW
1330 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PA"+DES$+":S"+DESE$+",A"+DES$:GOSUB 2280
'LOAD EQUATIONS
1340 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PT"+DES$+":V"+DESE$+",T"+DES$+",V":GOSUB
2280 'LOAD EQUATIONS
1350 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PW"+DES$+":AG"+DESE$+",W"+DES$:GOSUB 2280
'LOAD EQUATIONS
1360 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PAH"+DES$+":AH"+DESE$+",AH"+DES$+",V":GOSUB
2280 'LOAD EQUATIONS
1370 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PAI"+DES$+":AM"+DESE$+",AI"+DES$:GOSUB 2280
'LOAD EQUATIONS
1380 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PAN"+DES$+":AN"+DESE$+",AN"+DES$+",V":GOSUB
2280 'NTSHIFT PARAMETER
1390 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PCR"+DES$+":CR"+DESE$+",AO"+DES$+",V":GOSUB
2280 'SUPPLY SHIFT PARAMETER
1400 GOTO 1430
1410 W$="/L"+G$+NAM$+CYM$(0,K)+",S1,PAC"+DES$+":AE"+DESE$+",AC"+DES$+",V":GOSUB
2280 'LOAD VALUES RATHER THAN EQUATIONS FOR CONSTANT COUNTRY
1420 GOTO 1510
1430 FOR I=1 TO LPR:IF PRMO(I)=1 THEN 1500 'LOOP TO OMIT PRODUCT
1440 LO$=STR$(KP+7+2*LPR+I)
1450 W$="/UE"+LO$+":F"+LO$:GOSUB 2280:W$="/UJ"+LO$+":AZ"+LO$:GOSUB 2280
1460 W$="/BE"+LO$+":F"+LO$:GOSUB 2280:W$="/BJ"+LO$+":AZ"+LO$:GOSUB 2280
1470 W$="/CC"+LO$+":D"+LO$+",W"+LO$:GOSUB 2280
1480 W$="/CG"+LO$+":I"+LO$+",AC"+LO$:GOSUB 2280
1490 W$="/PW"+LO$+":AE"+LO$:GOSUB 2280
1500 NEXT I
1510 LO$=STR$(8+2*LPR):W$="=A1":GOSUB 2280:GOSUB 2410
1520 W$=FILE$+CYM$(0,K):GOSUB 2270
1530 W$="=A"+LO$:GOSUB 2280:GOSUB 2410:W$=FILE$+CYM$(0,K):GOSUB 2270
1540 W$="/FCA,TC":GOSUB 2280
1550 W$="/U"+STR$(VAL(DES$)+2):GOSUB 2280
1560 W$="/FEB"+STR$(VAL(DES$)+2)+":AO"+STR$(VAL(DES$)+2)+",TR":GOSUB 2280
1570 W$="/P"+STR$(VAL(DES$)+2):GOSUB 2280
1580 LBB$=STR$(KP+8+2*LPR):LBE$=STR$(KP+7+3*LPR)
1590 W$="/UI"+LBB$+":I"+LBE$:GOSUB 2280
1600 W$="/BB"+LBB$+":I"+LBE$:GOSUB 2280
1610 FOR I=1 TO LPR:LO$=STR$(KP+7+2*LPR+I)
1620 IF D(I,K)=0 THEN 1670
1630 W$="=B"+LO$:GOSUB 2280
1640 GOSUB 2410
1650 GOSUB 2420
1660 W$="1!B"+LO$:GOSUB 2270
1670 NEXT I
1680 W$="=A1":GOSUB 2280
1690 W$="!":GOSUB 2280
1700 W$="/FR"+HD$+",TR":GOSUB 2380
1710 NEXT K
1720 W$="//SGS1":GOSUB 2380
1730 W$="=A1":GOSUB 2380
1740 W$="=A1":GOSUB 2280:GOSUB 2410
1750 W$=FILE$+"WD":GOSUB 2280:GOSUB 2400
1760 W$="=A"+HD$:GOSUB 2280:GOSUB 2410
1770 W$=FILE$+"WD":GOSUB 2280:GOSUB 2400
1780 W$="/TV":GOSUB 2380
1790 W$="{STATUS "+CHR$(34)+"Adding world market clearing mechanism to SWOPSIM
world model --> "+FILE$+"WD"+WDN$+CHR$(34)+"}":GOSUB 2380
1800 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.,
56568"+CHR$(34)+"}":GOSUB 2380
1810 HD$=STR$(8+2*LPR):HD1$=STR$(7+2*LPR)
1820 W$="=AC"+HD$:GOSUB 2280:W$="SUPDEMB":GOSUB 2280:GOSUB 2450:GOSUB 2400
1830 W$="=AD"+HD$:GOSUB 2280:W$="BWDPRICE":GOSUB 2280:GOSUB 2450:GOSUB 2400
1840 W$="=AE"+HD$:GOSUB 2280:W$="WDTRADE":GOSUB 2280:GOSUB 2450:GOSUB 2400
1850 W$="=AG"+HD$:GOSUB 2280:W$="WEIGHT":GOSUB 2280:GOSUB 2450:GOSUB 2400
1860 W$="=AH"+HD$:GOSUB 2280:W$="LWDPRICE":GOSUB 2280:GOSUB 2450:GOSUB 2400
1870 W$="=AJ"+HD$:GOSUB 2280:W$="WDPRICED":GOSUB 2280:GOSUB 2450:GOSUB 2400
1880 W$="=AK"+HD$:GOSUB 2280:W$="WDPRICE%":GOSUB 2280:GOSUB 2450:GOSUB 2400
1890 FOR I=1 TO LPR
1900 CT$=STR$(8+2*LPR+I):W$="=AC"+CT$:GOSUB 2280
1910 W$="0":GOSUB 2280
1920 FOR K=1 TO LCY
1930 W$="/C"+STR$(K+1)+"!AC"+CT$+",AC"+CT$+",+":GOSUB 2280
1940 GOSUB 2410:NEXT K
1950 GOSUB 2410:GOSUB 2420:GOSUB 2400:W$="=AG"+CT$:GOSUB 2280
1960 IF NTRD(I)=1 THEN W$="0" ELSE W$="0.8"
1970 IF W$="0" GOTO 1990
1980 IF LEN(PRM$(0,I))>2 THEN W$="0.1"
1990 GOSUB 2280
2000 W$="=AE"+CT$:GOSUB 2280
2010 W$="SUM(2."+STR$(LCY+1)+"!AE"+CT$+")"
2020 GOSUB 2280:GOSUB 2420:GOSUB 2400
2030 W$="=AH"+CT$:GOSUB 2280
```

```
2040 W$="B"+CT$+"*(1-AG"+CT$+"*AE"+CT$+"/(AC"+CT$+"+10))":GOSUB 2280
2050 GOSUB 2420:GOSUB 2400
2060 W$="=AJ"+CT$:GOSUB 2280
2070 W$="AH"+CT$+"-AD"+CT$:GOSUB 2280
2080 GOSUB 2420:GOSUB 2400
2090 W$="=AK"+CT$:GOSUB 2280
2100 W$="(AH"+CT$+"-AD"+CT$+")*100/AD"+CT$:GOSUB 2280
2110 GOSUB 2430:GOSUB 2400
2120 W$="/CB"+CT$+",AD"+CT$+",V":GOSUB 2280:W$="=AD"+CT$:GOSUB 2270:GOSUB
2410:GOSUB 2420:GOSUB 2400
2130 W$="=B"+CT$:GOSUB 2280:GOSUB 2410:GOSUB 2420:W$="AH"+CT$:GOSUB 2270
2140 NEXT I
2150 W$="=A1":GOSUB 2280:GOSUB 2410
2160 W$="/FR"+HD$+",TR":GOSUB 2380
2170 W$=FILE$+"WD":GOSUB 2280:GOSUB 2400
2180 W$="=A"+HD$:GOSUB 2280:GOSUB 2410
2190 W$=FILE$+"WD":GOSUB 2280:GOSUB 2400
2200 W$="=AE"+RIGHT$(HD1$,LEN(HD1$)-1):GOSUB 2380
2210 W$="!":GOSUB 2280
2220 W$="//SS":GOSUB 2380
2230 W$="//SQ,Y":GOSUB 2380
2240 CLOSE 1
2250 SYSTEM
2260 END
2270 GOSUB 2280:PRINT #1,"/P";WW$;WSQ$:RETURN 'SAVE A STRING AND PROTECT A CELL
2280 P0=INSTR(W$," "):IF P0=0 THEN 2300 'REMOVE BLANKS FROM STRING
2290 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 2280
2300 IF LEFT$(W$,1)="/" THEN GOTO 2380
2310 IF W$="!" THEN W$="{CALC)":GOTO 2380
2320 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2330 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
2340 IF LEFT$(W$,2)="1!" THEN 2350 ELSE 2370
2350 WWW$=STR$(K+1)+"!"+WW$
2360 PRINT #1,"{LETC";WWW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2370 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2380 PRINT #1,W$;WSQ$:RETURN 'SAVE A STRING
2390 PRINT #1,W$:RETURN 'SAVE WITHOUT WSQ$
2400 PRINT #1,"/P";WW$;WSQ$:RETURN 'PROTECT A CELL
2410 PRINT #1,"/U";WW$;WSQ$:RETURN 'UNPROTECT A CELL
2420 PRINT #1,"/FE";WW$;",I";WSQ$:RETURN 'FORMAT A CELL WITH I
2430 PRINT #1,"/FE";WW$;",$";WSQ$:RETURN 'FORMAT A CELL WITH $
2440 PRINT #1,"/FE";WW$;",TL";WSQ$:RETURN 'FORMAT A CELL WITH TL
2450 PRINT #1,"/FE";WW$;",TR";WSQ$:RETURN 'FORMAT A CELL WITH TR
2460 PRINT #1,"/FE";WW$;",G";WSQ$:RETURN 'FORMAT A CELL WITH GENERAL
```

```
            SWOPSIM Program
-------------------------------------------------------------------
COMODMOD        Program to create a single commodity world model for the
                commodity CD from country model spreadsheets in the model
                NAME.
REQUIREMENTS    The C:\NAME model subdirectory must contain initialized
                country/region spreadsheets for all countries in NAME.
OUTPUT (D:)     Single commodity model D:NAMEcCD.
-------------------------------------------------------------------
COMMAND         COMODMOD  NAME CD
-------------------------------------------------------------------

:COMODMOD (ADD 4 LETTER MODEL NAME AND 2 LETTER COMMODITY CODE WHEN EXECUTING)
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO -------------------------------------------------------------------
ECHO COMODMOD       Program to create a single commodity world model for the
ECHO                commodity CD from country model spreadsheets in the model
ECHO                NAME.
ECHO REQUIREMENTS   The C:\NAME model subdirectory must contain initialized
ECHO                country/region spreadsheets for all countries in NAME.
ECHO OUTPUT (D:)    Single commodity model D:NAMEcCD.
ECHO -------------------------------------------------------------------
ECHO COMMAND        COMODMOD  NAME CD
ECHO -------------------------------------------------------------------
IF FILE%1 == FILE   ECHO ERROR = You forgot model NAME; Enter: COMODMOD NAME CD
IF FILE%1 == FILE   GOTO END
IF FILE%2 == FILE   ECHO ERROR = You forgot commodity CoDe; Enter: COMODMOD NAME
CD
IF FILE%2 == FILE   GOTO END
COPY C:\%1\%1.PRN D:
ECHO %1, %2, > D:COMODMOD.TXT
IF EXIST D:TEST.* ERASE D:TEST.*
IF EXIST D:%1c%2.CAL ERASE D:%1c%2.CAL
C:\SWOPSIM\COMODMOD
CALL D:TEST
ERASE D:TEST.BAT
:END ECHO ON

10 REM - COMODMOD - CREATE WORLD PRODUCT SPREADSHEET FOR SELECTED PRODUCT
20 REM COUNTRY/REGION SPREADSHEETS MUST HAVE BASE PRICE AND QUANTITY DATA ADDED
TO THEM BEFORE THIS PROGRAM IS RUN
30 CLS 'XQT FILE IS CREATED FOR PRODUCT SELECTED FROM MASTER FILE
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FILE
50 WSQ$="~"
60 PRINT"PROGRAM TO CREATE A WORLD PRODUCT MODEL FROM COUNTRY/REGION"
70 PRINT"SPREADSHEETS.  THE SPREADSHEETS SHOULD HAVE ELASTICITIES, BASE DATA,"
80 PRINT"AND EQUATIONS ADDED TO THEM BEFORE THIS PROGRAM IS RUN."
90 OFILE$=XO$+"COMODMOD.TXT"
100 PRINT:OPEN"I",1,OFILE$:INPUT #1,FILE$,COMOD$:CLOSE 1 'READ MODEL AND
COMMODITY NAME
110 NAM$=FILE$+"b"
120 NAMC$=FILE$+"c"
130 PRINT:PRINT"READING MASTER FILE - ";FILE$:PRINT
140 DIM PRM$(0,250) 'MASTER FILE CAN CONTAIN ABOUT UP TO 250 PRODUCT GROUPS
150 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
160 DIM CYMO(42) 'VECTOR OF CODES TO OMIT COUNTRY/REGION FROM MODEL (0=OMIT)
```

```
170 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
180 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
190 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
200 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
210 LCL=LEN(CL$)/2
220 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
230 FOR I=1 TO LCL
240 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
250 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
260 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
270 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
280 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
290 LCLL=LEN(CL$)/2
300 FOR I=1 TO LCLL
310 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
320 CL$=""
330 OFILE$=XO$+FILE$+".PRN"
340 OPEN"I",1,OFILE$
350 DIM D(123,42)
360 LINE INPUT #1,W$ 'BEGIN READING MASTER PRN FILE
370 LINE INPUT #1,W$
380 LINE INPUT #1,W$
390 LINE INPUT #1,W$
400 LINE INPUT #1,CY$
410 LINE INPUT #1,W$
420 STAR=(INSTR(CY$,"-")-11)/3
430 LCY=(LEN(CY$)-8)/3
440 IF STAR < LCY THEN LCY=STAR
450 PRINT:PRINT"COUNTRIES/REGIONS ARE:":PRINT
460 FOR I=1 TO LCY
470 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
480 LPR=0
490 PRINT:PRINT:PRINT"PRODUCT GROUPS ARE:":PRINT
500 LPR=LPR+1
510 LINE INPUT#1,W$
520 WP$=MID$(W$,5,4)
530 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 550
540 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 530
550 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 630 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
560 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
570 X$=MID$(W$,(J-1)*3+9,3)
580 IF X$="  D" THEN X$="  2"
590 IF X$="  S" THEN X$="  3"
600 IF X$=" SD" OR X$=" DS" THEN X$="  4"
610 D(LPR,J)=VAL(X$):NEXT J
620 GOTO 500
630 CLOSE 1
640 LPR=LPR-1
650 CLS:PRINT:PR$=COMOD$:PRINT"Commodity ";PR$;" was chosen.":PRINT
660 FOR J=1 TO LPR
670 IF PR$=PRM$(0,J) THEN 700
680 NEXT J
690 PRINT:PRINT PR$;" was not in model ";FILE$;".":PRINT:GOTO 2560
700 REM END OF LOOP TO CHECK TO SEE IF PRODUCT IS IN MODEL
710 PRINT:PRINT "Product ";PR$;" was in the model: ";FILE$:PRINT:PRINT
720 FOR K=1 TO LCY:CYMO(K)=1:NEXT K 'FILL WITH CODES (1's) TO KEEP
COUNTRY/REGIONS
730 PRINT:PRINT"COUNTRY/REGIONS ARE:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
740 PRINT:INPUT"Omit any COUNTRY/REGIONS (Y or N)";ROMIT$ 'LOOP TO OMIT
COUNTRY/REGIONS BY KEEPING QUANTITIES CONSTANT
750 IF LEFT$(ROMIT$,1)="Y" THEN 760 ELSE 890
760 PRINT:PRINT"COUNTRY/REGIONS are:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
770 PRINT:INPUT"COUNTRY/REGION TO OMIT (HIT ENTER TO CONTINUE)";ROMIT$
780 IF ROMIT$="RW" THEN PRINT:PRINT"RW NOT PERMITTED":ROMIT$="":GOTO 770
790 IF ROMIT$="" THEN 840
800 FOR KK=1 TO LCY:IF CYM$(0,KK)=ROMIT$ THEN 830
810 NEXT KK
820 GOTO 770
830 CYMO(KK)=0:ROMIT$="":GOTO 770
840 CLS:PRINT"COUNTRY/REGIONS ARE:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
850 PRINT:PRINT"YOU HAVE OMITTED: ":PRINT:FOR K=1 TO LCY:IF CYMO(K)=0 THEN PRINT
CYM$(0,K);" ";
860 NEXT K
870 PRINT:PRINT:INPUT"OKAY (Y OR N)";ROMIT$
880 IF LEFT$(ROMIT$,1)="N" THEN GOTO 720
890 PRINT:PRINT"Continuing with ";PR$;" . . .":PRINT
900 OFILE$=XO$+"TEST.BAT"
910 OPEN"O",1,OFILE$
920 W$="ERASE "+XO$+NAMC$+PR$+".*":GOSUB 2660
930 W$="CALL "+XR$+"SC "+XO$+"TEST":GOSUB 2660
940 W$="ERASE "+XO$+"TEST.XQT":GOSUB 2660
950 W$="ERASE "+XO$+FILE$+".PRN":GOSUB 2660
960 W$="ERASE "+XO$+"COMODMOD.TXT":GOSUB 2660
970 W$="DIR "+XO$+NAMC$+"??.CAL/W":GOSUB 2660
980 CLOSE 1
990 FOR K=1 TO LPR
1000 IF PR$=PRM$(0,K) THEN 1020
1010 NEXT K
1020 PN=K
1030 OFILE$=XO$+"TEST.XQT"
1040 OPEN"O",1,OFILE$ 'OPEN PRODUCT XQT FILE
1050 W$="{MACRO}":GOSUB 2660
1060 W$="{WINDOWSOFF}":GOSUB 2650
1070 W$="{PANELOFF}":GOSUB 2650
1080 W$="{STATUS "+CHR$(34)+"Creating World Single Commodity Model:
"+NAMC$+PR$+CHR$(34)+"}":GOSUB 2650
1090 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2650
1100 PRINT:PRINT
1110 KI$=STR$(8+2*LPR)
```

```
1120 G$=XI$+FILE$+"\"
1130 W$="/L"+G$+NAM$+CYM$(0,LCY)+",PB"+KI$+":CV"+KI$+",B1":GOSUB 2580
1140 W$="=CY1":GOSUB 2580:W$="LIBSHR":GOSUB 2580:W$="=A1":GOSUB 2580
1150 W$="=A1":GOSUB 2580
1160 W$=NAMC$+PRM$(0,PN):GOSUB 2580:GOSUB 2680
1170 W$="/FR1,TR":GOSUB 2580
1180 FOR K=1 TO LCY 'MAJOR LOOP TO LOAD EQUATIONS FOR EACH COUNTRY/REGION
1190 PRINT CYM$(0,K);" ";
1200 W$="=A"+STR$(K+1):GOSUB 2580
1210 W$=CHR$(34)+CYM$(0,K):GOSUB 2580:W$="/FE,TR":GOSUB 2580:W$="/P":GOSUB 2580
1220 IF D(PN,K)=0 THEN 1470 'IF PRODUCT NOT MODELED FOR COUNTRY, THEN SKIP
1230 KI$=STR$(PN+2*LPR+8) 'ROW LIFTED FROM COUNTRY DATA SET
1240 IF CYMO(K)=0 THEN 1250 ELSE 1280
1250 W$="/L"+G$+NAM$+CYM$(0,K)+",PG"+KI$+":I"+KI$+",G"+STR$(K+1)+",V":GOSUB 2580
'BASE DATA
1260 W$="/L"+G$+NAM$+CYM$(0,K)+",PAC"+KI$+":AE"+KI$+",AC"+STR$(K+1)+",V":GOSUB
2580 'EQUATION NUMBERS
1270 GOTO 1470
1280 W$="/L"+G$+NAM$+CYM$(0,K)+",PB"+KI$+":V"+KI$+",B"+STR$(K+1)+",V":GOSUB 2580
'BASE DATA
1290 W$="/L"+G$+NAM$+CYM$(0,K)+",PW"+KI$+":X"+KI$+",W"+STR$(K+1):GOSUB 2580
'LIBERALIZED PRICE EQUATIONS
1300 W$="/L"+G$+NAM$+CYM$(0,K)+",PY"+KI$+":AB"+KI$+",Y"+STR$(K+1)+",V":GOSUB
2580 'CONSTANTS
1310 W$="/L"+G$+NAM$+CYM$(0,K)+",PAC"+KI$+":DC"+KI$+",AC"+STR$(K+1):GOSUB 2580
'EQUATIONS AND INDICATORS
1320 PO$=STR$(K+1)
1330 W$="=AC"+PO$:GOSUB 2580:GOSUB 2670
1340 W$="/CCZ"+PO$+":CZ"+PO$+",AC"+PO$
1350 W$=W$+",N":GOSUB 2580:GOSUB 2680 'COPY COMODMOD SUPPLY EQUATION
1360 W$="=BF"+PO$:GOSUB 2580:GOSUB 2670
1370 W$="=BG"+PO$:GOSUB 2580:GOSUB 2670
1380 W$="/CDA"+PO$+":DB"+PO$+",BF"+PO$
1390 W$=W$+",N":GOSUB 2580:GOSUB 2680 'COPY COMODMOD GOVERNMENT EXPENDITURE
EQUATIONS
1400 W$="=BL"+PO$:GOSUB 2580:GOSUB 2670
1410 W$="/CDC"+PO$+":DC"+PO$+",BL"+PO$
1420 W$=W$+",N":GOSUB 2580:GOSUB 2680 'COPY COMODMOD MINIMUM PRODUCER SURPLUS
EQUATION
1430 W$="=N"+PO$:GOSUB 2580:W$="CY"+PO$+"*AJ"+PO$:GOSUB 2580 'FORMULA FOR PSW
1440 W$="=O"+PO$:GOSUB 2580:W$="CY"+PO$+"*AK"+PO$:GOSUB 2580 'FORMULA FOR CSW
1450 W$="=P"+PO$:GOSUB 2580:W$="CY"+PO$+"*AL"+PO$:GOSUB 2580 'FORMULA FOR MSW
1460 W$="=Q"+PO$:GOSUB 2580:W$="CY"+PO$+"*AM"+PO$:GOSUB 2580 'FORMULA FOR ESW
1470 NEXT K
1480 SL$=RIGHT$(STR$(LCY+3),LEN(STR$(LCY+3))-1) 'SOLUTION MECH. ROW
1490 W$="/FR"+SL$+",TR":GOSUB 2580
1500 W$="=G"+SL$:GOSUB 2580 'BEGIN CREATING WORLD MARKET CLEARING MECH.
1510 W$="0":GOSUB 2580
1520 FOR K=1 TO LCY:KI$=STR$(PN+2*LPR+8)
1530 W$="/CG"+STR$(K+1)+":G"+STR$(K+1)+",G"+SL$+",+":GOSUB 2580
1540 NEXT K
1550 X$="0":Y$="0":Z$="0":U$="0" 'WRITE BASE AVERAGE WORLD TRADE
1560 FOR J=1 TO LCY:PS$=RIGHT$(STR$(J+1),LEN(STR$(J+1))-1)
1570 IF J<12 THEN X$=X$+"+ABS(I"+PS$+")" ELSE GOTO 1590
1580 GOTO 1640
1590 IF J<22 THEN Y$=Y$+"+ABS(I"+PS$+")" ELSE GOTO 1610
1600 GOTO 1640
1610 IF J<32 THEN Z$=Z$+"+ABS(I"+PS$+")" ELSE GOTO 1630
1620 GOTO 1640
1630 U$=U$+"+ABS(I"+PS$+")"
1640 NEXT J
1650 W$="=I"+SL$:GOSUB 2580
1660 W$=X$:GOSUB 2580:GOSUB 2680
1670 W$="=J"+SL$:GOSUB 2580
1680 W$=Y$:GOSUB 2580:GOSUB 2680
1690 W$="=K"+SL$:GOSUB 2580
1700 W$=Z$:GOSUB 2580:GOSUB 2680
1710 W$="=L"+SL$:GOSUB 2580
1720 W$=U$:GOSUB 2580:GOSUB 2680
1730 W$="=M"+SL$:GOSUB 2580
1740 W$=CHR$(34)+"ABWDTRD":GOSUB 2580:GOSUB 2680
1750 W$="=N"+SL$:GOSUB 2580
1760 W$="(I"+SL$+"+J"+SL$+"+K"+SL$+"+L"+SL$+")/2":GOSUB 2580:GOSUB 2680
1770 X$="0":Y$="0":Z$="0":U$="0" 'WRITE BASE AVERAGE WORLD TRADE
1780 FOR J=1 TO LCY:PS$=RIGHT$(STR$(J+1),LEN(STR$(J+1))-1)
1790 IF J<12 THEN X$=X$+"+ABS(AE"+PS$+")" ELSE GOTO 1810
1800 GOTO 1860
1810 IF J<22 THEN Y$=Y$+"+ABS(AE"+PS$+")" ELSE GOTO 1830
1820 GOTO 1860
1830 IF J<32 THEN Z$=Z$+"+ABS(AE"+PS$+")" ELSE GOTO 1850
1840 GOTO 1860
1850 U$=U$+"+ABS(AE"+PS$+")"
1860 NEXT J
1870 W$="=P"+SL$:GOSUB 2580
1880 W$=X$:GOSUB 2580:GOSUB 2680
1890 W$="=Q"+SL$:GOSUB 2580
1900 W$=Y$:GOSUB 2580:GOSUB 2680
1910 W$="=R"+SL$:GOSUB 2580
1920 W$=Z$:GOSUB 2580:GOSUB 2680
1930 W$="=S"+SL$:GOSUB 2580
1940 W$=U$:GOSUB 2580:GOSUB 2680
1950 W$="=T"+SL$:GOSUB 2580
1960 W$=CHR$(34)+"ABWDTEQ":GOSUB 2580:GOSUB 2680
1970 W$="=U"+SL$:GOSUB 2580
1980 W$="(P"+SL$+"+Q"+SL$+"+R"+SL$+"+S"+SL$+")/2":GOSUB 2580:GOSUB 2680
1990 W$="=W"+SL$:GOSUB 2580
2000 W$=CHR$(34)+"WDTRADE%":GOSUB 2580:GOSUB 2680
2010 W$="=X"+SL$:GOSUB 2580
2020 GOSUB 2700
2030 W$="(U"+SL$+"-N"+SL$+")*100/N"+SL$:GOSUB 2580:GOSUB 2680
2040 W$="=Y"+SL$:GOSUB 2580
2050 W$=CHR$(34)+"WDPRICE%":GOSUB 2580:GOSUB 2680
2060 W$="=Z"+SL$:GOSUB 2580
2070 GOSUB 2700
```

```
2080 W$="(AD"+SL$+"-AB"+SL$+")*100/AB"+SL$:GOSUB 2580:GOSUB 2680
2090 W$="=AJ"+SL$:GOSUB 2580
2100 W$=CHR$(34)+"SUPDEM%":GOSUB 2580:GOSUB 2680
2110 W$="=AK"+SL$:GOSUB 2580
2120 GOSUB 2700
2130 W$="(SUM(AC1:AC"+STR$(LCY+1)+")-G"+SL$+")*100/G"+SL$:GOSUB 2580:GOSUB 2680
2140 W$="=G"+SL$:GOSUB 2580:GOSUB 2680
2150 W$="=AD"+SL$:GOSUB 2580
2160 W$="B"+STR$(1+LCY):GOSUB 2580:GOSUB 2680
2170 W$="=AC"+SL$:GOSUB 2580
2180 W$=CHR$(34)+"LWDPRICE":GOSUB 2580:GOSUB 2680
2190 W$="=AB"+SL$:GOSUB 2580
2200 W$="/CB"+STR$(1+LCY)+":B"+STR$(1+LCY)+",AB"+SL$:GOSUB 2580:GOSUB 2680
2210 W$="=AA"+SL$:GOSUB 2580
2220 W$=CHR$(34)+"WDPRICE":GOSUB 2580:GOSUB 2680
2230 W$="=AE"+SL$:GOSUB 2580
2240 W$="SUM(AE2:AE"+STR$(LCY+1)+")":GOSUB 2580:GOSUB 2680
2250 W$="=AG"+SL$:GOSUB 2580
2260 W$=CHR$(34)+"DAMP.WT":GOSUB 2580:GOSUB 2680
2270 W$="=AH"+SL$:GOSUB 2580
2280 W$="1":GOSUB 2580:GOSUB 2680
2290 W$="=AI"+SL$:GOSUB 2580
2300 W$="AD"+SL$+"*(1-AH"+SL$+"*AE"+SL$+"/G"+SL$+")":GOSUB 2580:GOSUB 2680
2310 FOR K=1 TO LCY
2320 IF CYMO(K)=0 OR D(PN,K)=0 THEN 2360
2330 W$="=B"+STR$(K+1):GOSUB 2580
2340 W$="/U":GOSUB 2580
2350 W$="AI"+SL$:GOSUB 2580:GOSUB 2680
2360 NEXT K
2370 W$="/L"+G$+NAM$+"RW,PS1:S1,A"+SL$:GOSUB 2580:GOSUB 2680
2380 W$="/UBB:BC":GOSUB 2650
2390 W$="/UCH:CI":GOSUB 2650
2400 W$="/BCH:CI":GOSUB 2650
2410 W$="/UCK:CL":GOSUB 2650
2420 W$="/BCK:CL":GOSUB 2650
2430 W$="/UCZ:DC":GOSUB 2650
2440 W$="/BCZ:DC":GOSUB 2650
2450 PRINT:PRINT
2460 W$="/PC:CU":GOSUB 2650
2470 W$="=A1":GOSUB 2650
2480 W$="/UB1:CZ1":GOSUB 2650
2490 W$="/FEB1:CZ1,TR":GOSUB 2650
2500 W$="/PB1:CZ1":GOSUB 2650
2510 W$="!":GOSUB 2580
2520 W$="/PA":GOSUB 2650
2530 W$="/S"+XO$+NAMC$+PRM$(0,PN)+",A":GOSUB 2580 'SAVE THE SPREADSHEET
2540 W$="/O,Y":GOSUB 2580
2550 CLOSE 1
2560 SYSTEM
2570 END
2580 PO=INSTR(W$," "):IF PO=0 THEN 2600 'REMOVE BLANKS FROM STRING
2590 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 2580
2600 IF LEFT$(W$,1)="/" THEN GOTO 2650
2610 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2620 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
2630 IF W$="!" THEN W$="{CALC}":GOTO 2650
2640 PRINT #1,"{LETC ";WW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2650 PRINT #1,W$;WSQ$:RETURN 'SAVE A STRING
2660 PRINT #1,W$:RETURN 'SAVE A STRING WITHOUT WSQ$
2670 PRINT #1,"/U";WW$;WSQ$:RETURN 'UNPROTECT A CELL
2680 PRINT #1,"/P";WW$;WSQ$:RETURN 'PROTECT A CELL
2690 PRINT #1,"/FE";WW$;",I":RETURN 'FORMAT A CELL WITH I
2700 PRINT #1,"/FE";WW$;",$":RETURN 'FORMAT A CELL WITH $
```

```
                    SWOPSIM Program
-------------------------------------------------------------------------
FORMULA         Program to add liberalization and/or projection formulas
                to an existing world model spreadsheet NAMEWDMC.
                The liberalization formulas option allows the full or
                partial liberalization of all products in the world model.
                The projection formula options inserts shifters for
                supply equations based on growth rates and for demand
                equations based on growth rates of per capita income and
                population.  Note that WORLDMOD creates a world model
                from NAME labeled NAMEWD.  However, the user can rename
                this model with an additional 2 letter Model Code and thus
                maintain many world models created with different
                characteristics.  If MC is not specified, NAMEWD is chosen.
REQUIREMENTS    A world model spreadsheet on the C:\NAME subdirectory.
OUTPUT (D:)     NAMEWDMC.CAL world model with formulas.
-------------------------------------------------------------------------
COMMAND         FORMULA  NAME MC
-------------------------------------------------------------------------
```

```
:FORMULA
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO -------------------------------------------------------------------------
ECHO FORMULA        Program to add liberalization and/or projection formulas
ECHO                to an existing world model spreadsheet NAMEWDMC.
ECHO                The liberalization formulas option allows the full or
ECHO                partial liberalization of all products in the world model.
ECHO                The projection formula options inserts shifters for
ECHO                supply equations based on growth rates and for demand
ECHO                equations based on growth rates of per capita income and
ECHO                population.  Note that WORLDMOD creates a world model
ECHO                from NAME labeled NAMEWD.  However, the user can rename
ECHO                this model with an additional 2 letter Model Code and thus
ECHO                maintain many world models created with different
ECHO                characteristics.  If MC is not specified, NAMEWD is chosen.
ECHO REQUIREMENTS   A world model spreadsheet on the C:\NAME subdirectory.
ECHO OUTPUT (D:)    NAMEWDMC.CAL world model with formulas.
```

```
ECHO ------------------------------------------------------------------------
ECHO COMMAND       FORMULA  NAME MC
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: FORMULA NAME MC
IF FILE%1 == FILE GOTO END
IF EXIST C:\%1\%1WD.CAL GOTO C1
ECHO ERROR = C:\%1\%1WD.CAL does not exist
:C1
IF EXIST D:%1WM.CAL ERASE D:%1WM.CAL
COPY C:\%1\%1.PRN D:
COPY C:\%1\%1WD%2.CAL D:
ECHO %1, %2, >D:FORMULA.TXT
C:\SWOPSIM\FORMULA
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:FORMULA.TXT
ERASE D:%1.PRN
CLS
DIR D:%1???.CAL/W
DIR D:*.XQT
:END ECHO ON
```

```
10 REM -FORMULA- ADD VARIABLE, FORMULA, OR VALUE TO SELECTED PRODUCT ROW(S) OF
WORLD MODEL
20 REM NECESSARY DATA AND VARIABLES FOR ANY FORMULA (EXCEPT A TIME COUNTER) MUST
ALREADY BE IN THE COUNTRY/REGION SPREADSHEET WHEN THE WORLD MODEL IS CREATED
30 CLS
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 PRINT"Program to add a variable, formula, or value to selected product"
70 PRINT"rows of a world model spreadsheet.  The world model should exist"
80 PRINT"on the input subdirectory before this program is run.  Lines of"
90 PRINT"uncompiled basic should be edited to change formula entries."
100 OFILE$=XO$+"FORMULA.TXT"
110 OPEN"I",1,OFILE$:INPUT #1,FILE$,WMC$:CLOSE 1 'READ MODEL NAME
120 NAM$=FILE$
130 PRINT:PRINT"Reading master file - ";FILE$:PRINT
140 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN ABOUT UP TO 110 PRODUCT GROUPS
150 DIM PRMO(123) 'VECTOR OF CODES TO OMIT PRODUCT IN FORMULA GENERATION
160 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
170 DIM CYMO(42) 'VECTOR OF CODES TO OMIT COUNTRY/REGION FROM MODEL (0=OMIT)
180 DIM OU$(0,123) 'VECTOR OF SUPPLY -OU- CODES
190 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
200 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
210 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
220 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDRDSDTDUDVDW"
230 LCL=LEN(CL$)/2
240 DIM CLM$(0,254) '254 COLUMNS MAXIMUM
250 FOR I=1 TO LCL
260 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
270 CL$="DXDYDZEAEBECEDEEEFEGEHEIEJEKELEMENEOEPEQERESETEUEVEWEXEYEZFAFBFCFDFE"
280 CL$=CL$+"FFFGFHFIFJFKFLFMFNFOFPFQFRFSFTFUFVFWFXFYFZGAGBGCGDGEGFGGGHGIGJGK"
290 CL$=CL$+"GLGMGNGOGPGQGRGSGTGUGVGWGXGYGZHAHBHCHDHEHFHGHHHIHJHKHLHMHNHOHPHQ"
300 CL$=CL$+"HRHSHTHUHVHWHXHYHZIAIBICIDIEIFIGIHIIIJIKILIMINIOIPIQIRISIT"
310 LCLL=LEN(CL$)/2
320 FOR I=1 TO LCLL
330 CLM$(0,I+LCL)=MID$(CL$,(I-1)*2+1,2):NEXT I
340 CL$=""
350 OFILE$=XO$+FILE$+".PRN"
360 OPEN"I",1,OFILE$
370 DIM D(123,42)
380 LINE INPUT #1,W$ 'BEGIN READING MASTER PRN FILE
390 LINE INPUT #1,W$
400 LINE INPUT #1,W$
410 LINE INPUT #1,W$
420 LINE INPUT #1,CY$
430 LINE INPUT #1,W$
440 STAR=(INSTR(CY$,"-")-11)/3
450 LCY=(LEN(CY$)-8)/3
460 IF STAR < LCY THEN LCY=STAR
470 PRINT:PRINT"Countries/regions are:":PRINT
480 FOR I=1 TO LCY
490 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
500 LPR=0
510 PRINT:PRINT:PRINT"Product groups are:":PRINT
520 LPR=LPR+1
530 LINE INPUT#1,W$
540 WP$=MID$(W$,5,4)
550 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 570
560 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 550
570 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 660 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
580 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
590 X$=MID$(W$,(J-1)*3+9,3)
600 IF X$="  D" THEN X$="  2"
610 IF X$="  S" THEN X$="  3"
620 IF X$=" SD" OR X$=" DS" THEN X$="  4"
630 D(LPR,J)=VAL(X$):NEXT J
640 OU$(0,LPR)=MID$(W$,(LCY+1)*3+9,3)
650 GOTO 520
660 CLOSE 1
670 LPR=LPR-1
680 FOR J=1 TO LPR:PRMO(J)=0:NEXT J:PRINT
690 PRINT:PRINT:INPUT"Add projection variables to shift supply/demand (Y or N
{default})";PROJ$
700 IF PROJ$="" THEN PROJ$="N"
710 PRINT:PRINT:INPUT"Add formulas to use support wedges for liberalization (Y
{default} or N) ";WLIB$
720 IF WLIB$="" THEN WLIB$="Y"
730 IF WLIB$="N" THEN PR$="ALL":GOTO 840
740 CLS:PRINT"Products are:":PRINT:FOR J=1 TO LPR:PRINT PRM$(0,J);" ";:NEXT
J:PRINT
750 PRINT:PRINT
760 PRINT:PRINT"You have selected:  ";
```

```
770 FOR J=1 TO LPR:IF PRMO(J)=1 THEN PRINT PRM$(0,J);" ";
780 NEXT J
790 PRINT
800 PRINT:PRINT:PRINT"Enter 2 letter product code or 'ALL' {default} for all
products"
810 INPUT "(press 'Enter' for default - press DONE if done entering 2 letter
codes)  ";PR$
820 IF LEFT$(PR$,1) ="D" THEN 900
830 IF PR$="" THEN PR$="ALL"
840 IF PR$="ALL" THEN 850 ELSE 870
850 FOR I=1 TO LPR:PRMO(I)=1:NEXT I
860 GOTO 940
870 FOR I=1 TO LPR:IF PR$=PRM$(0,I) THEN PRMO(I)=1
880 NEXT I
890 GOTO 740
900 CLS:PRINT"You have selected: ";:FOR I=1 TO LPR:IF PRMO(I)=1 THEN PRINT
PRM$(0,I);" ";
910 NEXT I:PRINT
920 PRINT:Y$="":INPUT"Is this okay (Y or N) ";Y$
930 IF Y$="Y" THEN 940 ELSE 680
940 FOR K=1 TO LCY:CYMO(K)=1:NEXT K 'FILL WITH CODES (1's) TO KEEP
COUNTRY/REGIONS
950 IF WLIB$="N" THEN 1130
960 CLS:PRINT:INPUT"Omit any countries/regions (Y or N {default})";ROMIT$ 'LOOP
TO OMIT FORMULAS FOR COUNTRIES/REGIONS
970 IF ROMIT$="" THEN ROMIT$="N"
980 IF LEFT$(ROMIT$,1)="Y" THEN 990 ELSE 1130
990 PRINT:PRINT"Countries/regions are:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
1000 PRINT:INPUT"Country/region to omit (hit 'Enter' to continue)";ROMIT$
1010 REM IF ROMIT$="RW" THEN PRINT:PRINT"RW not permitted":ROMIT$="":GOTO 710
1020 IF ROMIT$="" THEN 1110
1030 FOR KK=1 TO LCY:IF CYM$(0,KK)=ROMIT$ THEN 1060
1040 NEXT KK
1050 GOTO 1000
1060 CYMO(KK)=0:ROMIT$=""
1070 CLS:PRINT"Countries/regions are:":PRINT:FOR K=1 TO LCY:PRINT CYM$(0,K);"
";:NEXT K:PRINT
1080 PRINT:PRINT"You have omitted: ":PRINT:FOR K=1 TO LCY:IF CYMO(K)=0 THEN
PRINT CYM$(0,K);" ";
1090 NEXT K:PRINT
1100 GOTO 1000
1110 PRINT:PRINT:INPUT"Okay (Y or N)";ROMIT$
1120 IF LEFT$(ROMIT$,1)="N" THEN GOTO 940
1130 IF INDIC$="" THEN INDIC$="N"
1140 OFILE$=XO$+"TEST.XQT":OPEN"O",1,OFILE$ 'OPEN PRODUCT XQT FILE
1150 W$="{MACRO}":GOSUB 2100
1160 W$="{WINDOWSOFF}":GOSUB 2090
1170 W$="{PANELOFF}":GOSUB 2090
1180 W$="{STATUS "+CHR$(34)+"Inserting formulas into:
"+NAM$+"WD"+WMC$+CHR$(34)+"}":GOSUB 2090
1190 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2090
1200 W$="/L"+XO$+NAM$+"WD"+WMC$+",A":GOSUB 2010
1210 IF PROJ$="Y" THEN 1220 ELSE 1250
1220 K=0:W$="=AF1":GOSUB 2010:W$="PROJYEARS":GOSUB 2010:GOSUB 2130
1230 W$="=AG1":GOSUB 2010:W$="0":GOSUB 2010 'TIME COUNTER FOR PROJECTIONS
1240 W$="/FEAG1,I":GOSUB 2090
1250 FOR K=1 TO LCY 'LOOP TO ADD VARIABLE, FORMULA, OR VALUE
1260 W$="//SGS"+STR$(K+1):GOSUB 2010
1270 IF CYMO(K)=0 THEN 1940
1280 W$="{STATUS "+CHR$(34)+"Inserting formulas for "+CYM$(0,K)+" into:
"+NAM$+"WD"+WMC$+CHR$(34)+"}":GOSUB 2090
1290 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2090
1300 IF PROJ$="Y" THEN 1310 ELSE 1340
1310 JB$=STR$(9+2*LPR):JE$=STR$(8+3*LPR)
1320 B$="b"
1330
W$="/L"+XI$+FILE$+"\"+FILE$+B$+CYM$(0,K)+",S1,PCL"+JB$+":CO"+JE$+",CL"+JB$:GOSUB
2010
1340 FOR J=1 TO LPR 'LOOP THROUGH PRODUCTS FOR EACH COUNTRY/REGION
1350 IF PRMO(J)=0 THEN 1930
1360 IF D(J,K)=0 THEN 1930
1370 REM J1=COUNTRY-PRODUCT ROW, J11=COUNTRY NAME ROW, J22=WORLD MARKET ROW
1380 J1=8+2*LPR+J:J11=1:J22=J1
1390 REM ------------------------------------------------------------------
1400 REM PUT COLUMN HEADS, FORMULA, ETC.; IN THE FOLLOWING STATEMENTS
1410 REM ------------------------------------------------------------------
1420 REM ------------PROJECTION VARIABLES AND DATA-------------------------
1430 IF PROJ$="Y" THEN 1440 ELSE 1570 'PUT PROJECTION VARIABLES AS S/D SHIFTERS
1440 TCT$="AG1" 'LOCATION OF TIME COUNTER VARIABLE IN WORLD MODEL
1450 IF J>1 THEN 1480
1460 W$="=AG"+STR$(J11):GOSUB 2010 'COPY TIME COUNTER VALUE FOR EACH COUNTRY
1470 W$="1!"+TCT$:GOSUB 2010
1480 W$="=L"+STR$(J1):GOSUB 2010:GOSUB 2140 'SUPPLY SHIFT VARIABLE
1490 W$="((1+AG"+STR$(J1)+")^"+TCT$+"-1)":GOSUB 2010:GOSUB 2130 'SUPPLY GROWTH
VARIABLE
1500 INCG$="M1" 'LOCATION OF INCOME GROWTH RATE
1510 POPG$="P1" 'LOC. OF POP. GROWTH RATE
1520 W$="=CK"+STR$(J1):GOSUB 2010:GOSUB 2140 'DEMAND SHIFT VARIABLE
1530
W$="(((1+"+INCG$+")^"+TCT$+"*(1+"+POPG$+")^-"+TCT$+")^AH"+STR$(J1)+"*(1+"+POPG$+
")^"+TCT$
1540 W$=W$+")-1":GOSUB 2010:GOSUB 2130 'DEMAND SHIFT VARIABLE
1550 W$="=M"+STR$(J1):GOSUB 2010:GOSUB 2140 'ADJUSTED DEMAND SHIFT VARIABLE
1560 W$="(1-CN"+STR$(J1)+")*CK"+STR$(J1):GOSUB 2010:GOSUB 2130
1570 REM -------------PROTECTION FORMULAS-----------------------------------
1580 IF WLIB$="N" THEN 1800 ELSE 1590
1590 W$="=AJ1":GOSUB 2010:W$="0":GOSUB 2010
1600 W$="/FEAJ1,$":GOSUB 2090
1610 W$="=AJ2":GOSUB 2010:W$="DPSW":GOSUB 2010:GOSUB 2150:GOSUB 2130
1620 W$="/FEAJ2,TR":GOSUB 2090
1630 W$="=AK1":GOSUB 2010:W$="0":GOSUB 2010
```

```
1640 W$="/FEAK1,$":GOSUB 2090
1650 W$="=AK2":GOSUB 2010:W$="CSW":GOSUB 2010:GOSUB 2150:GOSUB 2130
1660 W$="/FEAK2,TR":GOSUB 2090
1670 W$="=AL1":GOSUB 2010:W$="0":GOSUB 2010
1680 W$="/FEAL1,$":GOSUB 2090
1690 W$="=AL2":GOSUB 2010:W$="MSW":GOSUB 2010:GOSUB 2150:GOSUB 2130
1700 W$="/FEAL2,TR":GOSUB 2090
1710 W$="=AM1":GOSUB 2010:W$="0":GOSUB 2010
1720 W$="/FEAM1,$":GOSUB 2090
1730 W$="=AM2":GOSUB 2010:W$="ESW":GOSUB 2010:GOSUB 2150:GOSUB 2130
1740 W$="/FEAM2,TR":GOSUB 2090
1750 W$="/FR2,TR":GOSUB 2090
1760 W$="=N"+STR$(J1):GOSUB 2010:GOSUB
2140:W$="AJ"+STR$(J11)+"*AJ"+STR$(J1):GOSUB 2010:GOSUB 2130 'DPSW IN PRICE
TRANSMISSION EQUATION
1770 W$="=O"+STR$(J1):GOSUB 2010:GOSUB
2140:W$="AK"+STR$(J11)+"*AK"+STR$(J1):GOSUB 2010:GOSUB 2130 'CSW IN PRICE
TRANSMISSION EQUATION
1780 W$="=P"+STR$(J1):GOSUB 2010:GOSUB
2140:W$="AL"+STR$(J11)+"*AL"+STR$(J1):GOSUB 2010:GOSUB 2130 'MSW IN PRICE
TRANSMISSION EQUATION
1790 W$="=Q"+STR$(J1):GOSUB 2010:GOSUB
2140:W$="AM"+STR$(J11)+"*AM"+STR$(J1):GOSUB 2010:GOSUB 2130 'ESW IN PRICE
TRANSMISSION EQUATION
1800 W$="=A1":GOSUB 2010
1810 REM
1820 REM ----------ROOM FOR OTHER FORMULAS----------
1830 REM
1840 REM
1850 REM
1860 REM
1870 REM
1880 REM
1890 REM
1900 REM
1910 REM
1920 REM END OF VARIABLE ADDITION LINES
1930 NEXT J
1940 NEXT K
1950 W$="//SGS1":GOSUB 2010
1960 W$="=A1":GOSUB 2010
1970 W$="=AE"+RIGHT$(STR$(7+2*LPR),LEN(STR$(7+2*LPR))-1):GOSUB 2090
1980 W$="//SS,O":GOSUB 2090
1990 SYSTEM
2000 END
2010 P0=INSTR(W$," "):IF P0=0 THEN 2030 'REMOVE BLANKS FROM STRING
2020 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 2010
2030 IF LEFT$(W$,1)="/" THEN GOTO 2090
2040 IF W$="!" THEN W$="{CALC)":GOTO 2090
2050 IF LEFT$(W$,1)="=" THEN WW$=RIGHT$(W$,LEN(W$)-1):RETURN
2060 IF LEFT$(W$,1)=CHR$(34) THEN W$=RIGHT$(W$,LEN(W$)-1)
2070 WWW$=STR$(K+1)+"!"+WW$
2080 PRINT #1,"{LETC";WWW$;",";CHR$(34);W$;CHR$(34);"}":RETURN
2090 PRINT #1,W$;WSQ$:RETURN 'SAVE A STRING
2100 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
2110 PRINT #1,"/FE";WW$;",$";WSQ$:RETURN 'FORMAT CELL AS I
2120 W$="/U"+BL$:GOSUB 2010:W$="/B"+BL$:GOSUB 2010:RETURN
2130 PRINT #1,"/P";WW$;WSQ$:RETURN 'PROTECT A CELL
2140 PRINT #1,"/U";WW$;WSQ$:RETURN 'UNPROTECT A CELL
2150 PRINT #1,"/FE";WW$;",TR";WSQ$:RETURN 'FORMAT CELL AS I
```

```
                    SWOPSIM Output Program
-------------------------------------------------------------------------
EOUT            Program to put a page of country Elasticities OUT to a
                printer or a disk file.  Elasticities for supply, demand,
                and feed demand are included.
REQUIREMENTS    Country model file (NAMEbCD.CAL) containing elasticities
                on the model subdirectory.  The batch file PRINTSOL must
                be available and configured on the batch subdirectory if
                print option is used.  The template file NAMESUP.CAL must
                be on the NAME model subdirectory to format the output.
OUTPUT (D:)     One page file of elasticities from a model (NAME)
                country (CD) spreadsheet on to the printer (P) or to a
                disk file (F).
-------------------------------------------------------------------------
COMMAND         EOUT  NAME CD P (or F)
-------------------------------------------------------------------------

:EOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO ----------------------------------------------------------------------
ECHO EOUT           Program to put a page of country Elasticities OUT to a
ECHO                printer or a disk file.  Elasticities for supply, demand,
ECHO                and feed demand are included.
ECHO REQUIREMENTS   Country model file (NAMEbCD.CAL) containing elasticities
ECHO                on the model subdirectory.  The batch file PRINTSOL must
ECHO                be available and configured on the batch subdirectory if
ECHO                print option is used.  The template file NAMESUP.CAL must
ECHO                be on the NAME model subdirectory to format the output.
ECHO OUTPUT (D:)    One page file of elasticities from a model (NAME)
ECHO                country (CD) spreadsheet on to the printer (P) or to a
ECHO                disk file (F).
ECHO ----------------------------------------------------------------------
ECHO COMMAND        EOUT  NAME CD P (or F)
ECHO ----------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: EOUT NAME CD P(or
F)
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: EOUT NAME CD P(or
F)
IF FILE%2 == FILE GOTO END
```

```
IF FILE%3 == FILE ECHO ERROR = You forgot Print (or File) code; Enter NAME CD
P(or F)
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\%1SUPD.CAL GOTO C1
ECHO You have not created the C:\%1\%1SUPD.CAL template spreadsheet yet!
GOTO END
:C1
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
REM Call batch file to set print size
IF F%3 == FP CALL C:\BATCH\PRINTSOL
COPY C:\%1\%1bRW.CAL D:
COPY C:\%1\%1SUPD.CAL D:
COPY C:\%1\%1b%2.CAL D:
REM The following statements write the SC5 macro to print out the elasticities.
ECHO {MACRO}{PANELOFF}{STATUS "Printing elasticities for:
%1b%2"}/LD:%1SUPD,A~{RSD}%1b%2~{ESC}!~ >D:TEST.XQT
IF F%3 == FP ECHO /OPGQ~/Q,Y >>D:TEST.XQT
IF F%3 == FF ECHO /OFD:%2~GQ~/Q,Y >>D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:%1SUPD.CAL
ERASE D:%1b%2.CAL
ERASE D:%1bRW.CAL
CLS
DIR D:*.PRN/W
:END ECHO ON
```

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SWOPSIM Output Program

CUSEOUT	Program to put CUStomized country Elasticities OUT to a disk file for CUStomized printing. Elasticities for supply, demand, and feed demand are included.
REQUIREMENTS	Country model file (NAMEbCD.CAL) containing elasticities on the model subdirectory. The template file NAMESUP.CAL must be on the NAME model subdirectory to format output.
OUTPUT (D:)	Multi-page file of elasticities from a model (NAME) country (CD) spreadsheet on a disk file that can be printed if the HPLASER program NAMESMAL has been run.

COMMAND	CUSEOUT NAME CD

```
:CUSEOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO ------------------------------------------------------------------------
ECHO CUSEOUT        Program to put CUStomized country Elasticities OUT to a
ECHO                disk file for CUStomized printing.  Elasticities for
ECHO                supply, demand, and feed demand are included.
ECHO REQUIREMENTS   Country model file (NAMEbCD.CAL) containing elasticities
ECHO                on the model subdirectory.  The template file NAMESUP.CAL
ECHO                must be on the NAME model subdirectory to format output.
ECHO OUTPUT (D:)    Multi-page file of elasticities from a model (NAME)
ECHO                country (CD) spreadsheet on a disk file that can be
ECHO                printed if the HPLASER program NAMESMAL has been run.
ECHO ------------------------------------------------------------------------
ECHO COMMAND        CUSEOUT  NAME CD
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: CUSEOUT NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: CUSEOUT NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1SUPD.CAL GOTO C1
ECHO You have not created the C:\%1\%1SUPD.CAL template spreadsheet yet!
GOTO END
:C1
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
REM Call HPLASER to customize print size for model NAME
CALL HPLASER %1SMAL
COPY C:\%1\%1bRW.CAL D:
COPY C:\%1\%1SUPD.CAL D:
COPY C:\%1\%1b%2.CAL D:
REM The following statements write the SC5 macro to print out the elasticities.
ECHO {MACRO}{PANELOFF}{STATUS "Printing elasticities for:
%1b%2"}/LD:%1SUPD,A~{RSD}%1b%2~{ESC}{CALC} >D:TEST.XQT
ECHO /OFD:%2~GQ~/Q,Y >>D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:%1SUPD.CAL
ERASE D:%1b%2.CAL
ERASE D:%1bRW.CAL
CLS
DIR D:*.PRN/W
:END ECHO ON
```

SWOPSIM Output Program

BOUT	Program to put a page of country Base data OUT for the model NAME to a printer or to a disk file. Base data includes quantities, prices, and support information from the country model, base data, and support spreadsheets.
REQUIREMENTS	Country model spreadsheet (NAMEbCD.CAL) and country support spreadsheet file (NAMEsCD) on model NAME subdirectory. The batch file PRINTSOL must be available and configured on the batch subdirectory if the print option is used. The template file NAMEBASE.CAL must be on the NAME model subdirectory to collect and format the base data output.
OUTPUT (D:)	One page printout of model (NAME) base data for country (CD) on the printer (P) or to a disk file (F).

COMMAND	BOUT NAME CD P(or F)

```
:BOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO ------------------------------------------------------------------------
ECHO BOUT           Program to put a page of country Base data OUT for the
ECHO                model NAME to a printer or to a disk file.  Base data
ECHO                includes quantities, prices, and support information from
ECHO                the country model, base data, and support spreadsheets.
ECHO REQUIREMENTS   Country model spreadsheet (NAMEbCD.CAL) and country support
ECHO                spreadsheet file (NAMEsCD) on model NAME subdirectory.
ECHO                The batch file PRINTSOL must be available and configured
ECHO                on the batch subdirectory if the print option is used.
ECHO                The template file NAMEBASE.CAL must be on the NAME model
ECHO                subdirectory to collect and format the base data output.
ECHO OUTPUT (D:)    One page printout of model (NAME) base data for
ECHO                country (CD) on the printer (P) or to a disk file (F).
ECHO ------------------------------------------------------------------------
ECHO COMMAND        BOUT  NAME CD P(or F)
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: BOUT NAME CD P(or
F)
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: BOUT NAME CD P(or
F)
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot P or F code; Enter: BOUT NAME CD P(or
F)
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\%1BASE.CAL GOTO C1
ECHO You have not created the C:\%1\%1BASE.CAL template spreadsheet yet!
GOTO END
:C1
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
IF EXIST D:B.CAL ERASE D:B.CAL
IF EXIST D:S.CAL ERASE D:S.CAL
IF EXIST D:%1BASE.CAL ERASE D:%1BASE.CAL
REM Call batch file to set print size
IF F%3 == FP CALL C:\BATCH\PRINTSOL
COPY C:\%1\%1BASE.CAL D:
COPY C:\%1\%1s%2.CAL D:S.CAL
COPY C:\%1\%1b%2.CAL D:B.CAL
IF EXIST D:%2BASE.CAL ERASE D:%2BASE.CAL
REM The following statements write the SC5 macro to print out the base data.
ECHO {MACRO}{PANELOFF}{STATUS "Printing base data for: %1 %2"}/LD:%1BASE,A~!~
>D:TEST.XQT
IF F%3 == FP ECHO /OPGQ~/Q,Y >>D:TEST.XQT
IF F%3 == FF ECHO /OFD:%2BASE~GQ~/SD:%2BASE,V~/Q,Y >>D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:%1BASE.CAL
ERASE D:B.CAL
ERASE D:S.CAL
CLS
DIR D:*.PRN/W
:END ECHO ON
```

```
                SWOPSIM Output Program
------------------------------------------------------------------------
CUSBOUT         Program to put CUStomized country Base data OUT for the
                model NAME to a disk file for printing.  Base data
                includes quantities, prices, and support information from
                the country model, base data, and support spreadsheets.
REQUIREMENTS    Country model spreadsheet (NAMEbCD.CAL) and country support
                spreadsheet file (NAMEsCD) on model NAME subdirectory.
                A format command must be activated by the HPLASER program
                which sets the laser printer if the disk file is printed.
                The template file NAMEBASE.CAL must be on the NAME model
                subdirectory to collect and format the base data output.
OUTPUT (D:)     Printout of model (NAME) base data for country (CD) on
                a disk file named NAME.PRN.
------------------------------------------------------------------------
COMMAND         CUSBOUT  NAME CD
------------------------------------------------------------------------
```

```
:CUSBOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO ------------------------------------------------------------------------
ECHO CUSBOUT        Program to put CUStomized country Base data OUT for the
ECHO                model NAME to a disk file for printing.  Base data
ECHO                includes quantities, prices, and support information from
ECHO                the country model, base data, and support spreadsheets.
ECHO REQUIREMENTS   Country model spreadsheet (NAMEbCD.CAL) and country support
ECHO                spreadsheet file (NAMEsCD) on model NAME subdirectory.
ECHO                A format command must be activated by the HPLASER program
ECHO                which sets the laser printer if the disk file is printed.
ECHO                The template file NAMEBASE.CAL must be on the NAME model
ECHO                subdirectory to collect and format the base data output.
ECHO OUTPUT (D:)    Printout of model (NAME) base data for country (CD) on
ECHO                a disk file named NAME.PRN.
ECHO ------------------------------------------------------------------------
ECHO COMMAND        CUSBOUT  NAME CD
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: CUSBOUT NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: CUSBOUT NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1BASE.CAL GOTO C1
ECHO You have not created the C:\%1\%1BASE.CAL template spreadsheet yet!
GOTO END
:C1
```

```
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
IF EXIST D:B.CAL ERASE D:B.CAL
IF EXIST D:S.CAL ERASE D:S.CAL
IF EXIST D:%1BASE.CAL ERASE D:%1BASE.CAL
REM Call HPLASER batch file to set print size
CALL HPLASER %1SMAL
COPY C:\%1\%1BASE.CAL D:
COPY C:\%1\%1s%2.CAL D:S.CAL
COPY C:\%1\%1b%2.CAL D:B.CAL
REM The following statements write the SC5 macro to print out the base data.
ECHO {MACRO}{PANELOFF}{STATUS "Printing base data for: %1 %2"}/LD:%1BASE,A~!~
>D:TEST.XQT
ECHO /OFD:%2BASE~GQ~/Q,Y >>D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:%1BASE.CAL
ERASE D:B.CAL
ERASE D:S.CAL
CLS
DIR D:*.PRN/W
:END ECHO ON
```

```
                SWOPSIM Output Program
-------------------------------------------------------------------------
SOUT            Program to put a file of country Solution values OUT
                to the printer or a disk.
REQUIREMENTS    Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
                Template files NAMESOUT.CAL for the solution output and
                NAMEANAL.cal for the analysis output on the model
                subdirectory.  Three files are also called which can be
                customized.  PRINTSOL.BAT configures the printer,
                NAMESOUT.BAT converts a country code to a model page
                number, and NAMEROWC.BAT gives the row and columns of
                the model solution file.
INPUT           Model NAME, country/region CoDe, solution code X (1 or
                2 digits), and P or F for printer or disk file.
OUTPUT (D:)     Printout or disk file NAMECDM.PRN.  If disk file is chosen,
                a file (NAMECDM.CAL) is also created.  This file can be
                saved for access by other output programs such as TABLE.
                Analysis of the solution is produced on the D: drive as
                NAMECDAX.CAL (and NAMECDAX.PRN if the F option is chosen).
-------------------------------------------------------------------------
COMMAND         SOUT  NAME CD X P(or F)
-------------------------------------------------------------------------
```

```
:SOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO -------------------------------------------------------------------------
ECHO SOUT           Program to put a file of country Solution values OUT
ECHO                to the printer or a disk.
ECHO REQUIREMENTS   Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
ECHO                Template files NAMESOUT.CAL for the solution output and
ECHO                NAMEANAL.cal for the analysis output on the model
ECHO                subdirectory.  Three files are also called which can be
ECHO                customized.  PRINTSOL.BAT configures the printer,
ECHO                NAMESOUT.BAT converts a country code to a model page
ECHO                number, and NAMEROWC.BAT gives the row and columns of
ECHO                the model solution file.
ECHO INPUT          Model NAME, country/region CoDe, solution code X (1 or
ECHO                2 digits), and P or F for printer or disk file.
ECHO OUTPUT (D:)    Printout or disk file NAMECDM.PRN.  If disk file is chosen,
ECHO                a file (NAMECDM.CAL) is also created.  This file can be
ECHO                saved for access by other output programs such as TABLE.
ECHO                Analysis of the solution is produced on the D: drive as
ECHO                NAMECDAX.CAL (and NAMECDAX.PRN if the F option is chosen).
ECHO -------------------------------------------------------------------------
ECHO COMMAND        SOUT  NAME CD X P(or F)
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: SOUT NAME CD X P(or
F)
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: SOUT NAME CD X
P(or F)
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot solution code X; Enter: SOUT NAME CD X
P(or F)
IF FILE%3 == FILE GOTO END
IF FILE%4 == FILE ECHO ERROR = You forgot Print or File mark; Enter: SOUT NAME
CD X P(or F)
IF FILE%4 == FILE GOTO END
IF EXIST C:\%1\%1WM%3.CAL GOTO C1
ECHO ERROR = The solution %1WM%3.CAL does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST D:%1ANAL.CAL ERASE D:%1ANAL.CAL
IF EXIST D:O.CAL ERASE D:O.CAL
IF EXIST D:W.CAL ERASE D:W.CAL
IF EXIST D:B.CAL ERASE D:B.CAL
IF EXIST D:%1SOUT.CAL ERASE D:%1SOUT.CAL
IF EXIST D:%1%2%3.CAL ERASE D:%1%2%3.CAL
IF EXIST D:%1%2S%3.CAL ERASE D:%1%2S%3.CAL
IF EXIST D:%1%2A%3.CAL ERASE D:%1%2A%3.CAL
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
IF EXIST D:? ERASE D:?
IF EXIST D:%1%2S%3.PRN ERASE D:%1%2S%3.PRN
IF EXIST D:%1%2A%3.PRN ERASE D:%1%2A%3.PRN
COPY C:\%1\%1b%2.CAL D:B.CAL
COPY C:\%1\%1SOUT.CAL D:
COPY C:\%1\%1ANAL.CAL D:
ECHO {MACRO}{PANELOFF}{STATUS "Gathering solution of %1WM%3 for %2"} >D:A
ECHO /LC:\%1\%1WM%3~ >D:B
```

```
REM Call batch file to translate country/region CoDe to solution page number
CALL C:\BATCH\%1SOUT %2
ECHO /LD:B~ >>D:B
REM Call batch file containing row and column layout of model
CALL C:\BATCH\%1ROWC
ECHO /SD:O~V~/SD:%1%2%3~V~ >>D:B
ECHO /Z,Y~/LC:\%1\%1WM%3~S1~A~/SD:W~V~ >D:C
ECHO /Z,Y~/LD:%1SOUT,A~!~ >D:D
IF F%4 == FP ECHO /O%4GQ~/SD:%1%2S%3~V~/Z,Y >>D:D
IF F%4 == FF ECHO /O%4D:%1%2S%3~GQ~/SD:%1%2S%3~V~/Z,Y >>D:D
ECHO /LD:%1ANAL~R~!~ >D:E
ECHO /SD:%1%2A%3~V~ >>D:E
ECHO /SD:%1%2A%3.WK1~PVDG3:DV53~ >>D:E
IF F%4 == FP ECHO /O%4GQ~/Q,Y >>D:E
IF F%4 == FF ECHO /O%4D:%1%2A%3~GQ~/Q,Y >>D:E
COPY D:A+D:B+D:C+D:D+D:E D:TEST.XQT
ERASE D:?
REM Call batch file to set print size
IF F%4 == FP CALL C:\BATCH\PRINTSOL
CALL C:SC D:TEST
ERASE D:%1ANAL.CAL
ERASE D:O.CAL
ERASE D:W.CAL
ERASE D:B.CAL
ERASE D:%1SOUT.CAL
ERASE D:TEST.XQT
CLS
DIR D:*.*/W
:END ECHO ON
```



```
              SWOPSIM Output Program
-------------------------------------------------------------------------
CUSSOUT       Program to put a CUStomized file of country Solution
              values OUT to a disk.
REQUIREMENTS  Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
              Template file NAMESOUT.CAL for the solution output on the
              model subdirectory must be customized for the model NAME.
INPUT         Model NAME, country/region CoDe, and solution code X (1 or
              2 digits).
OUTPUT (D:)   Disk file NAMECDM.PRN and a SuperCalc file NAMECDM.CAL
              which can be saved for access by other output programs
              such as TABLE.
-------------------------------------------------------------------------
COMMAND       CUSSOUT  NAME CD X
-------------------------------------------------------------------------

:CUSSOUT
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO -------------------------------------------------------------------------
ECHO CUSSOUT       Program to put a CUStomized file of country Solution
ECHO               values OUT to a disk.
ECHO REQUIREMENTS  Solution file X, NAMEWMX.CAL, on model NAME subdirectory.
ECHO               Template file NAMESOUT.CAL for the solution output on the
ECHO               model subdirectory must be customized for the model NAME.
ECHO INPUT         Model NAME, country/region CoDe, and solution code X (1 or
ECHO               2 digits).
ECHO OUTPUT (D:)   Disk file NAMECDM.PRN and a SuperCalc file NAMECDM.CAL
ECHO               which can be saved for access by other output programs
ECHO               such as TABLE.
ECHO -------------------------------------------------------------------------
ECHO COMMAND       CUSSOUT  NAME CD X
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: CUSSOUT NAME CD X
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: CUSSOUT NAME CD X
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot solution code X; Enter: CUSSOUT NAME
CD X
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\%1WM%3.CAL GOTO C1
ECHO ERROR = The %1WM%3.CAL solution does not exist on the C:\%1 subdirectory
GOTO END
:C1
IF EXIST D:O.CAL ERASE D:O.CAL
IF EXIST D:W.CAL ERASE D:W.CAL
IF EXIST D:B.CAL ERASE D:B.CAL
IF EXIST D:%1SOUT.CAL ERASE D:%1SOUT.CAL
IF EXIST D:%1%2%3.CAL ERASE D:%1%2%3.CAL
IF EXIST D:%1%2S%3.CAL ERASE D:%1%2S%3.CAL
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
IF EXIST D:? ERASE D:?
IF EXIST D:%1%2S%3.PRN ERASE D:%1%2S%3.PRN
COPY C:\%1\%1b%2.CAL D:B.CAL
COPY C:\%1\%1SOUT.CAL D:
ECHO {MACRO}{PANELOFF}{STATUS "Gathering solution of %1WM%3 for %2"} >D:A
ECHO /LC:\%1\%1WM%3~ >D:B
REM Call batch file to translate country/region CoDe to solution page number
CALL C:\BATCH\%1SOUT %2
ECHO /LD:B~ >>D:B
REM Call batch file containing row and column layout of model
CALL C:\BATCH\%1ROWC
ECHO /SD:O~V~/SD:%1%2%3~V~ >>D:B
ECHO /Z,Y~/LC:\%1\%1WM%3~S1~A~/SD:W~V~ >D:C
ECHO /Z,Y~/LD:%1SOUT,A~!~ >D:D
ECHO /OFD:%1%2S%3~GQ~/SD:%1%2S%3~V~/Q,Y >>D:D
COPY D:A+D:B+D:C+D:D D:TEST.XQT
ERASE D:?
REM Call HPLASER program to customize print size
IF EXIST C:\BATCH\HPLASER.BAT CALL HPLASER %1SMAL
CALL C:SC D:TEST
ERASE D:O.CAL
```

```
ERASE D:W.CAL
ERASE D:B.CAL
ERASE D:%1SOUT.CAL
ERASE D:TEST.XQT
CLS
DIR D:*.*/W
:END ECHO ON


            SWOPSIM Program
-------------------------------------------------------------------------
TABLE         Program to create a cross-country table of a variable from
              a world model solution, a country/region model spreadsheet,
              or a country/region support spreadsheet.  The program
              prompts for variable names in the model NAME.
REQUIREMENTS  World model solution and country file for program SOUT,
              country/region model spreadsheet, or support spreadsheet
              must be saved on the model subdirectory NAME.
OUTPUT (D:)   Table of selected variable
-------------------------------------------------------------------------
COMMAND       TABLE NAME
-------------------------------------------------------------------------

:TABLE
ECHO OFF
CLS
ECHO                SWOPSIM Program
ECHO -------------------------------------------------------------------------
ECHO TABLE          Program to create a cross-country table of a variable from
ECHO                a world model solution, a country/region model spreadsheet,
ECHO                or a country/region support spreadsheet.  The program
ECHO                prompts for variable names in the model NAME.
ECHO REQUIREMENTS   World model solution and country file for program SOUT,
ECHO                country/region model spreadsheet, or support spreadsheet
ECHO                must be saved on the model subdirectory NAME.
ECHO OUTPUT (D:)    Table of selected variable
ECHO -------------------------------------------------------------------------
ECHO COMMAND        TABLE NAME
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: TABLE NAME
IF FILE%1 == FILE GOTO END
IF EXIST C:\%1\%1.CAL GOTO C1
ECHO ERROR = C:\%1\%1.CAL, the master file and table format, does not exist
ECHO         on the C:\%1 subdirectory
GOTO END
:C1
DIR \%1\%1WM?.CAL/W
DIR \%1\%1b??.CAL/W
DIR \%1\%1s??.CAL/W
COPY C:\%1\%1.PRN D:
ECHO %1, >D:TABLE.TXT
C:\SWOPSIM\TABLE
CALL D:TABCOP.BAT
ERASE D:TABCOP.BAT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:TABLE.TXT
ERASE D:%1.PRN
CLS
DIR D:T*.CAL/W
:END ECHO ON

10 REM -TABLE- CREATE TABLE FROM WORLD MODEL SIMULATION RESULTS OR
20 REM         COUNTRY/REGION SPREADSHEETS
30 CLS:PRINT:PRINT
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
50 WSQ$="~"
60 PRINT"Program to select a world model variable for insertion"
70 PRINT"into a cross country/region table in the master file format.":PRINT
80 PRINT"A table can be created from world model simulation results,"
90 PRINT"country/region model spreadsheets, or support worksheets"
100 PRINT:OFILE$=XO$+"TABLE.TXT"
110 OPEN"I",1,OFILE$:INPUT #1,FILE$:CLOSE 1 'READ MODEL NAME
120 FL$=FILE$
130 NAM$=FILE$+"b"
140 PRINT:PRINT"Reading master file - ";FILE$:PRINT
150 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 110 PRODUCT GROUPS
160 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
170 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
180 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
190 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
200 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
210 LCL=LEN(CL$)/2
220 DIM CLM$(0,123)
230 FOR I=1 TO LCL '122 COLUMNS MAX.
240 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
250 OFILE$=XO$+FILE$+".PRN"
260 OPEN"I",1,OFILE$
270 DIM D(123,42)
280 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
290 LINE INPUT #1,W$
300 LINE INPUT #1,W$
310 LINE INPUT #1,W$
320 LINE INPUT #1,CY$
330 LINE INPUT #1,W$
340 STAR=(INSTR(CY$,"-")-11)/3
350 LCY=(LEN(CY$)-8)/3
360 IF STAR < LCY THEN LCY=STAR
370 PRINT:PRINT"Countries/regions are:":PRINT
380 FOR I=1 TO LCY
390 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
400 LPR=0
410 PRINT:PRINT"Product groups are:":PRINT
420 LPR=LPR+1
```

```
430 LINE INPUT#1,W$
440 WP$=MID$(W$,5,4)
450 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 470
460 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 450
470 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 550 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
480 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
490 X$=MID$(W$,(J-1)*3+9,3)
500 IF X$="  D" THEN X$="  2"
510 IF X$="  S" THEN X$="  3"
520 IF X$=" SD" OR X$=" DS" THEN X$="  4"
530 D(LPR,J)=VAL(X$):NEXT J
540 GOTO 420
550 CLOSE 1:LPR=LPR-1
560 DIM N$(0,100) 'SUBROUTINE TO CREATE DATA COLUMN HEADS
570 N$(0,0)="Variable Column  Variable Description----------------------------"
580 N$(0,1)="WDPRICE     B   WorlD PRICE (in current solution)"
590 N$(0,2)="PRPRICE     C   base PRoducer PRICE"
600 N$(0,3)="CNPRICE     D   base CoNsumer PRICE"
610 N$(0,4)="TDPRICE     E   base TraDe PRICE"
620 N$(0,5)="XRATE       F   eXchange RATE"
630 N$(0,6)="SUPPLY      G   base SUPPLY quantity"
640 N$(0,7)="DEMAND      H   base DEMAND quantity"
650 N$(0,8)="NTRADE      I   base Net TRADE"
660 N$(0,9)="CTRAN.EL    J   Country price TRANsmission ELasticity variable"
670 N$(0,10)="WDPT.EL     K   product WorlD Price Trans. ELasticity variable"
680 N$(0,11)="SSHIFT      L   Supply SHIFT variable"
690 N$(0,12)="DSHIFT      M   Demand SHIFT variable"
700 N$(0,13)="PRSUBW      N   PRoducer SUBsidy Wedge variable"
710 N$(0,14)="CNSUBW      O   CoNsumer SUBsidy Wedge variable"
720 N$(0,15)="IMSUBW      P   IMport SUBsidy Wedge variable"
730 N$(0,16)="EXSUBW      Q   EXport SUBsidy Wedge variable"
740 N$(0,17)="SCROSSO     R   Supply equation CROSS price Overflow term"
750 N$(0,18)="DCROSSO     S   Demand equation CROSS price Overflow term"
760 N$(0,19)="TDCONST     T   world-TraDe price CONSTant"
770 N$(0,20)="PRCONST     U   PRoducer-trade price CONSTant"
780 N$(0,21)="CNCONST     V   CoNsumer-producer price CONSTant"
790 N$(0,22)="LPRPRICE    W   Liberalized PRoducer PRICE"
800 N$(0,23)="LCNPRICE    X   Liberalized CoNsumer PRICE"
810 N$(0,24)="SCROSS      Y   Supply equation CROSS price term"
820 N$(0,25)="DCROSS      Z   Demand equation CROSS price term"
830 N$(0,26)="SCONST      AA  Supply equation CONSTant"
840 N$(0,27)="DCONST      AB  Demand equation CONSTant"
850 N$(0,28)="SUPPLYEQ    AC  liberalized SUPPLY EQuation quantity"
860 N$(0,29)="DEMANDEQ    AD  liberalized DEMAND EQuation quantity"
870 N$(0,30)="NTRADEEQ    AE  liberalized Net TRADE EQuation quantity"
880 N$(0,31)="TRADEOQ     AF  equation making net TRADE = 0 or enforce price
policy"
890 N$(0,32)="SUPGROW     AG  SUPply GROWth rate"
900 N$(0,33)="INCELAS     AH  INCome ELASticity"
910 N$(0,34)="PTELAS      AI  Product world price Transmission ELASticity"
920 N$(0,35)="DPSW        AJ  Distortive Producer Subsidy Wedge amount"
930 N$(0,36)="CSW         AK  Consumer Subsidy Wedge amount"
940 N$(0,37)="MSW         AL  iMport Subsidy Wedge amount"
950 N$(0,38)="ESW         AM  Export Subsidy Wedge amount"
960 N$(0,39)="NTSSHIFT    AN  Non-Trade policy Supply SHIFT term"
970 N$(0,40)="SUPPLYD     AO  SUPPLY quantity Difference from base"
980 N$(0,41)="DEMANDD     AP  DEMAND quantity Difference from base"
990 N$(0,42)="NTRADED     AQ  Net TRADE quantity Difference from base"
1000 N$(0,43)="PRPRICED    AR  PRoducer PRICE Difference from base"
1010 N$(0,44)="CNPRICED,   AS  CoNsumer PRICE Difference from base"
1020 N$(0,45)="TDPRICE%    AT  TraDe PRICE % change from base"
1030 N$(0,46)="SUPPLY%     AU  SUPPLY quantity % change from base"
1040 N$(0,47)="PRPRICE%    AV  PRoducer PRICE % change from base"
1050 N$(0,48)="DEMAND%     AW  DEMAND quantity % change from base"
1060 N$(0,49)="CNPRICE%    AX  CoNsumer PRICE % change from base"
1070 N$(0,50)="NTRADE%     AY  Net TRADE quantity % change from base"
1080 N$(0,51)="PBSE        AZ  Producer Budget Subsidy Equivalent"
1090 N$(0,52)="CBSE        BA  Consumer Budget Subsidy Equivalent"
1100 N$(0,53)="PSURPLUS    BB  Producer SURPLUS change (total)"
1110 N$(0,54)="CSURPLUS    BC  Consumer SURPLUS change"
1120 N$(0,55)="GDPVAL      BD  Gross Domestic Product VALue (at LWDPRICE)"
1130 N$(0,56)="FARMVAL     BE  FARM VALue (at MKPRICE)"
1140 N$(0,57)="GOVTEXPD    BF  GOVernmenT EXPenDiture change from base"
1150 N$(0,58)="NEWGEXPD    BG  NEW Government EXPenDiture from base"
1160 N$(0,59)="WELFARE     BH  total WELFARE change"
1170 N$(0,60)="MKPRICE     BI  MarKet PRICE at producer level"
1180 N$(0,61)="CQRENT      BJ  Change in Quota RENT"
1190 N$(0,62)="PTAXE       BK  Producer TAX Equivalent (of supply controls)"
1200 N$(0,63)="MPSURPLUS   BL  Minimum (excluded) Producer SURPLUS change"
1210 N$(0,64)="LSHRPSW     BM  Liberalized SHaRe of dPSW (used for welfare cal.)"
1220 N$(0,65)="LSHRCSW     BN  Liberalized SHaRe of CSW (used for welfare cal.)"
1230 N$(0,66)="LSHRMSW     BO  Liberalized SHaRe of MSW (used for welfare cal.)"
1240 N$(0,67)="LSHRESW     BP  Liberalized SHaRe of ESW (used for welfare cal.)"
1250 N$(0,68)="BGREXP      BQ  Base GRoss EXPorts"
1260 N$(0,69)="BGRIMP      BR  Base GRoss IMPorts"
1270 N$(0,70)="LGREXP      BS  Liberalized (estimated) GRoss EXPorts"
1280 N$(0,71)="LGRIMP      BT  Liberalized (estimated) GRoss IMPorts"
1290 N$(0,72)="BWDPRICE    BU  Base WorlD PRICE"
1300 N$(0,73)="BNTRADEV    BV  Base Net TRADE Value (using base world price)"
1310 N$(0,74)="LNTRADEV    BW  Liberalized Net TRADE Value (using liberalized
world price)"
1320 N$(0,75)="NTRADEVD    BX  Net TRADE Value Difference from base"
1330 N$(0,76)="BSELFSFR    BY  Base SELF SuFficiency Ratio"
1340 N$(0,77)="LSELFSFR    BZ  Liberalized SELF SuFficiency Ratio"
1350 N$(0,78)="MBSE        CA  IMport Budget Subsidy Equivalent"
1360 N$(0,79)="EBSE        CB  Export Budget Subsidy Equivalent"
1370 N$(0,80)="GREXPD      CC  GRoss EXPort quantity Difference from base"
1380 N$(0,81)="GRIMPD      CD  GRoss IMPort quantity Difference from base"
1390 N$(0,82)="GREXP%      CE  GRoss EXPort quantity % change from base"
1400 N$(0,83)="GRIMP%      CF  GRoss IMPort quantity % change from base"
1410 N$(0,84)="BQRENT      CG  Base Quota RENT"
1420 N$(0,85)="BDEMPC      CH  Base DEMand Per Capita"
1430 N$(0,86)="LDEMPC      CI  Liberalized (new) DEMand Per Capita"
```

```
1440 N$(0,87)="BPVALUE    CJ  Base Producer VALUE"
1450 N$(0,88)="PSUPPRT    CK  value of Producer SUPPoRT"
1460 N$(0,89)="PROJADJ    CL  PROJection ADJustment variable for projections"
1470 N$(0,90)=".......    CM  (empty column)"
1480 N$(0,91)="SHNFED     CN  SHare of feeds Not FED in model"
1490 N$(0,92)="SHCONS     CO  SHare of intermediate product CONSumed in model"
1500 N$(0,93)=".......    CP  (empty column)"
1510 N$(0,94)="EXTREVC    CQ  EXTra REVenue Change from price policies"
1520 N$(0,95)="SETSIDE    CR  SET-aSIDE shift variable when set-asides removed"
1530 N$(0,96)="PPRMAT     CS  Producer PRice Minus set-Aside Tax"
1540 N$(0,97)="MKSUPRT    CT  MarKet SUPport Rate"
1550 N$(0,98)="BCVALUE    CU  Base Consumption VALUE"
1560 N$(0,99)="------>    **  Variable not in model list.
1570 NAM$=XO$+FILE$+"bWD,P"
1580 PRINT
1590 PRINT:PRINT"Note: If you want variables from Support Worksheets, select
'SW'"
1600 PRINT:PRINT:INPUT"Enter Column letter(s) of Variable (press 'Enter' for
Variable list) ";COL$
1610 IF COL$="" THEN 1680
1620 PRINT:PRINT"Do you have a supplemental file
(";XI$;FILE$;"\";FILE$;"-(b)TAB.CAL and ";
1630 PRINT XI$;FILE$;"\";FILE$;"TAB.XQT on ";XI$;FILE$;
1640 INPUT" (Y or N) ";TABF$
1650 IF TABF$<>"Y" THEN 1670
1660 PRINT:INPUT"Enter column letter(s) of aggregation weight from
country/region database       ('Enter' for no weight) ";WGT$
1670 IF COL$="SW" THEN SOU$=COL$:GOTO 1910
1680 IF LEN(COL$)=1 THEN COL$=" "+COL$
1690 FOR J=1 TO 99
1700 IF COL$=MID$(CL$,(J*2)+1,2) THEN GOTO 1720
1710 NEXT J
1720 T$=N$(0,J)
1730 IF LEN(COL$)>2 THEN 1600
1740 IF COL$="" THEN 1750 ELSE 1850
1750 CLS:PRINT N$(0,0):PRINT:FOR I=1 TO 20:PRINT N$(0,I):NEXT I
1760 PRINT:PRINT"                          ";:INPUT"PRESS 'enter' TO CONTINUE";W$
1770 CLS:PRINT N$(0,0):PRINT:FOR I=21 TO 40:PRINT N$(0,I):NEXT I
1780 PRINT:PRINT"                          ";:INPUT"PRESS 'enter' TO CONTINUE";W$
1790 CLS:PRINT N$(0,0):PRINT:FOR I=41 TO 60:PRINT N$(0,I):NEXT I
1800 PRINT:PRINT"                          ";:INPUT"PRESS 'enter' TO CONTINUE";W$
1810 CLS:PRINT N$(0,0):PRINT:FOR I=61 TO 80:PRINT N$(0,I):NEXT I
1820 PRINT:PRINT"                          ";:INPUT"PRESS 'enter' TO CONTINUE";W$
1830 CLS:PRINT N$(0,0):PRINT:FOR I=81 TO 98:PRINT N$(0,I):NEXT I
1840 GOTO 1600
1850 CLS:PRINT:PRINT"--> Take variable from World Model solution ";
1860 PRINT "[ * ]"
1870 PRINT"(where * = number or letter of solution saved from SOUT program"
1880 PRINT"of particular solution previously saved on input subdirectory),"
1890 PRINT:PRINT"or --> COUNTRY/REGION INPUT DATA spreadsheets [ CR ] ,"
1900 PRINT:INPUT"or --> Support Worksheets on input subdirectory [ SW ] ";SOU$
1910 PRINT:IF SOU$="" THEN CODE$="WM" ELSE CODE$=SOU$
1920 IF LEN(SOU$)>3 THEN 1850
1930 IF SOU$="" OR LEFT$(SOU$,2)="WM" THEN SOU$="WM"
1940 IF SOU$="SW" THEN 1950 ELSE 2010
1950 PRINT:PRINT"A different set of variables exists in the support worksheet."
1960 PRINT"You must give a column, row, and title for each variable"
1970 PRINT:INPUT"Column of variable on support spreadsheet ";HEADC$
1980 PRINT:INPUT"Row number of first value of variable";HEADR$
1990 BOTR$=STR$(VAL(HEADR$)+LPR-1)
2000 PRINT:INPUT"Enter name of variable";T$
2010 OFILE$=XO$+"TEST.XQT":OPEN"O",1,OFILE$
2020 W$="{MACRO}":GOSUB 3400
2030 W$="{WINDOWSOFF}":GOSUB 3390
2040 W$="{PANELOFF}":GOSUB 3390
2050 W$="{STATUS "+CHR$(34)+"Creating table for: "+T$+" from: "+FILE$+"
"+CODE$+CHR$(34)+"}":GOSUB 3390
2060 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 3390
2070
W$="/L"+XI$+FILE$+"\"+FILE$+",PA1:"+MID$(CL$,LCY*2+1,2)+STR$(4+LPR)+",A1":GOSUB
3360
2080 SUPT$="s"
2090 BASE$="b"
2100 W$="/GN":GOSUB 3360
2110 W$="/UA1:AR100":GOSUB 3360
2120 W$="/BB1:AP1":GOSUB 3360
2130 W$="=A2":GOSUB 3360:IF SOU$="SW" THEN W$=HEADC$ ELSE W$=COL$
2140 GOSUB 3360
2150 W$="/UA2":GOSUB 3360:W$="/FEA2:A2,TR":GOSUB 3360:W$="/PAW":GOSUB 3360
2160 W$="=A3":GOSUB 3390
2170 W$="TODAY":GOSUB 3390
2180 W$="=B1":GOSUB 3360
2190 W$=T$:GOSUB 3390
2200 W$="=B1":GOSUB 3360
2210 W$="/FE,,TL":GOSUB 3360
2220 W$="/BB5:AP100":GOSUB 3360
2230 W$="/PA1:AR100":GOSUB 3360
2240 W$="=A1":GOSUB 3360
2250 W$="/FGG":GOSUB 3360
2260 W$="/FGTR":GOSUB 3360
2270 W$="/GM":GOSUB 3360
2280 IF CODE$="" THEN SOURCE$=SOU$ ELSE SOURCE$=CODE$
2290 IF LEFT$(SOURCE$,2)="WM" THEN SDS$=XO$ ELSE SDS$=XI$+FILE$+"\"
2300 FOR I=1 TO LCY
2310 IF SOU$ <>"SW" THEN CODE$=CYM$(0,I)
2320 IF SOU$="WM" THEN BASE$=""
2330 I1=9+2*LPR
2340 IF SOU$="SW" THEN 2350 ELSE 2380
2350 W$="/L"+XI$+FILE$+"\"+FILE$+SUPT$+CYM$(0,I)+",P"+HEADC$+HEADR$+":"+HEADC$
2360 W$=W$+BOTR$+","+MID$(CL$,(I)*2+1,2)+"5,V":GOSUB 3360
2370 GOTO 2440
2380 PAGE$=""
2390 IF SOU$<>"CR" THEN CCODE$=CYM$(0,I) ELSE CCODE$=CODE$
```

```
2400 IF SOU$<>"CR" THEN SOLN$=SOU$ ELSE SOLN$=""
2410 IF SOU$<>"CR" THEN BBASE$="" ELSE BBASE$=BASE$
2420 W$="/L"+SDS$+FILE$+BBASE$+CCODE$+SOLN$+PAGE$+",P"+COL$+STR$(I1)+":"+COL$
2430 W$=W$+STR$(I1+LPR-1)+","+MID$(CL$,(I)*2+1,2)+"5,V":GOSUB 3360
2440 IF TABF$<>"Y" OR WGT$="" THEN 2480
2450 W$="/L"+XI$+FILE$+"\"+FILE$+BASE$+CYM$(0,I)+",P"+WGT$+STR$(I1)+":"+WGT$
2460 W$=W$+STR$(I1+LPR-1)+","+MID$(CL$,(I+52)*2+1,2)+"5,V":GOSUB 3360
2470
W$="/P"+MID$(CL$,(I+52)*2+1,2)+"5:"+MID$(CL$,(I+52)*2+1,2)+STR$(5+LPR-1):GOSUB
3360
2480 NEXT I
2490 IF LEFT$(SOURCE$,2)="WM" THEN 2500 ELSE 2640
2500 I11=(LCY)*(LPR+5)-1
2510 W$="/L"+SDS$+FILE$+BASE$+CODE$+",PAH"+STR$(I11)+":AH"+STR$(I11)+",S2":GOSUB
3360
2520 W$="/PS2:S2":GOSUB 3360
2530 IF TABF$="Y" THEN 2540 ELSE 2640
2540
W$="/L"+SDS$+FILE$+BASE$+CODE$+",PAH"+STR$(I11)+":AH"+STR$(I11)+",AH2":GOSUB
3360
2550 W$="/PAH2:AH2":GOSUB 3360
2560 W$="=R32":GOSUB 3360
2570 W$="AG.WT.= ":GOSUB 3360:W$="/P":GOSUB 3360
2580 W$="=S32":GOSUB 3360
2590 IF WGT$="" THEN 2620 ELSE 2600
2600 W$=WGT$:GOSUB 3360
2610 GOTO 2630
2620 W$="NONE":GOSUB 3360
2630 W$="/P":GOSUB 3360
2640
RT$="5":RB$=STR$(4+LPR):CR$=MID$(CL$,LCY*2+5,2):SUMR$=STR$(4+LPR+2):CNT$=STR$(4+
LPR+3):AVRG$=STR$(4+LPR+4)
2650 W$="="+SUMR$:GOSUB 3360:W$=CHR$(34)+"SUM":GOSUB 3360
2660 W$="="+CNT$:GOSUB 3360:W$=CHR$(34)+"COUNT":GOSUB 3360
2670 W$="="+AVRG$:GOSUB 3360:W$=CHR$(34)+"AVERAGE":GOSUB 3360
2680 CLL$=MID$(CL$,1*2+1,2)
2690 W$="="+CLL$+SUMR$:GOSUB 3360
2700 W$="SUM("+CLL$+RT$+":"+CLL$+RB$+")":GOSUB 3360
2710 W$="/FE,G":GOSUB 3360
2720 W$="="+CLL$+CNT$:GOSUB 3360
2730 W$="COUNT("+CLL$+RT$+":"+CLL$+RB$+")":GOSUB 3360
2740 W$="="+CLL$+AVRG$:GOSUB 3360
2750 W$=CLL$+SUMR$+"/(.000001+"+CLL$+CNT$+")":GOSUB 3360
2760 W$="/FE,G":GOSUB 3360
2770 CLLB$=MID$(CL$,2*2+1,2):CLLE$=MID$(CL$,(LCY+2)*2+1,2)
2780 W$="/R"+CLL$+SUMR$+":"+CLL$+AVRG$+","+CLLB$+SUMR$+":"+CLLE$+SUMR$:GOSUB
3360
2790 CLL$=MID$(CL$,(LCY+1)*2+1,2)
2800 W$="="+CLL$+SUMR$:GOSUB 3360
2810 W$=CHR$(34)+"   ------":GOSUB 3360
2820 W$="="+CLL$+CNT$:GOSUB 3360
2830 W$=CHR$(34)+"   ------":GOSUB 3360
2840 W$="="+CLL$+AVRG$:GOSUB 3360
2850 W$=CHR$(34)+"   ------":GOSUB 3360
2860 W$="="+MID$(CL$,(2+LCY)*2+1,2)+"3":GOSUB 3360
2870 W$=CHR$(34)+"SUM":GOSUB 3360
2880 W$="="+MID$(CL$,(3+LCY)*2+1,2)+"3":GOSUB 3360
2890 W$=CHR$(34)+"COUNT":GOSUB 3360
2900 W$="="+MID$(CL$,(4+LCY)*2+1,2)+"3":GOSUB 3360
2910 W$=CHR$(34)+"AVERAGE":GOSUB 3360
2920 RSUM$=MID$(CL$,(2+LCY)*2+1,2):RCNT$=MID$(CL$,(3+LCY)*2+1,2)
2930 RAVG$=MID$(CL$,(4+LCY)*2+1,2):RPOS$=STR$(4+1)
2940 W$="="+RSUM$+RPOS$:GOSUB
3360:W$="SUM(B"+RPOS$+":"+MID$(CL$,(LCY)*2+1,2)+RPOS$+")":GOSUB 3360
2950 W$="/FE,G":GOSUB 3360
2960 W$="="+RCNT$+RPOS$:GOSUB
3360:W$="COUNT(B"+RPOS$+":"+MID$(CL$,LCY*2+1,2)+RPOS$+")":GOSUB 3360
2970 W$="="+RAVG$+RPOS$:GOSUB
3360:W$=RSUM$+RPOS$+"/(.000001+"+RCNT$+RPOS$+")":GOSUB 3360
2980 W$="/FE,G":GOSUB 3360
2990 RPOSB$=STR$(6):RPOSE$=STR$(4+LPR)
3000 W$="/R"+RSUM$+RPOS$+":"+RAVG$+RPOS$+","+RSUM$+RPOSB$+":"+RSUM$+RPOSE$:GOSUB
3360
3010 W$="/P"+SUMR$+":"+AVRG$:GOSUB 3360
3020 W$="/P"+MID$(CL$,(2+LCY)*2+1,2)+":"+MID$(CL$,(4+LCY)*2+1,2):GOSUB 3360
3030 W$="=B2":GOSUB 3360:W$="/U":GOSUB
3360:W$="A1:"+MID$(CL$,(4+LCY)*2+1,2)+AVRG$:GOSUB 3360:W$="/P":GOSUB 3360
3040 W$="=A1":GOSUB 3360:W$="!":GOSUB 3360
3050 W$="=B2":GOSUB 3360
3060 IF TABF$="Y" THEN 3070 ELSE 3080
3070 W$="/L"+XI$+FILE$+"\"+FL$+TABM$:GOSUB 3360
3080 W$="=A2":GOSUB 3360:W$="/UA2:A2":GOSUB 3360
3090 W$=CHR$(34)+FILE$+"T"+SOU$:GOSUB 3360
3100 W$="/PA2:A2":GOSUB 3360
3110 W$="!":GOSUB 3360
3120 W$="=R1":GOSUB 3360
3130 W$="SOURCE->":GOSUB 3360:W$="/PR1:R1":GOSUB 3360
3140 W$="=S1":GOSUB 3360
3150 W$=SOURCE$:GOSUB 3360:W$="/PS1:S1":GOSUB 3360
3160 IF TABF$="Y" THEN 3170 ELSE 3210
3170 W$="=AG1":GOSUB 3360
3180 W$="SOURCE->":GOSUB 3360:W$="/PAG1:AG1":GOSUB 3360
3190 W$="=AH1":GOSUB 3360
3200 W$=SOURCE$:GOSUB 3360:W$="/PAH1:AH1":GOSUB 3360
3210 W$="=A1":GOSUB 3360:W$="/UA1:A1":GOSUB 3360
3220 W$="T"+COL$+SOURCE$
3230 IF LEFT$(SOURCE$,2)="SW" THEN W$="T"+HEADC$+SOURCE$
3240 GOSUB 3360:W$="/PA1:A1":GOSUB 3360
3250 W$="=A1":GOSUB 3360:W$="!":GOSUB 3360
3260 W$="=B2":GOSUB 3360
3270 W$="/S"+XO$+"T"+COL$+SOURCE$+",A":GOSUB 3360
3280 W$="{BEEP 2}":GOSUB 3390
3290 CLOSE 1:OFILE$=XO$+"TABCOP.BAT":OPEN"O",1,OFILE$
3300 W$="CLS":GOSUB 3400
```

```
3310 IF SDS$=XO$ THEN 3320 ELSE 3350
3320 W$="IF EXIST "+XO$+FILE$+BASE$+CODE$+".CAL GOTO C1":GOSUB 3400
3330 W$="COPY "+XI$+FILE$+"\"+FILE$+BASE$+CODE$+".CAL"+" "+XO$:GOSUB 3400
3340 W$=":C1":GOSUB 3400
3350 CLOSE 1:SYSTEM
3360 PO=INSTR(W$," "):IF PO=0 THEN 3380 'REMOVE BLANKS FROM STRING
3370 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 3360
3380 PRINT #1,W$;WSO$:RETURN 'PRINT STRING ON DISK FILE
3390 PRINT #1,W$;WSO$:RETURN
3400 PRINT #1,W$:RETURN 'PRINT WITHOUT WSO$
```

```
            SWOPSIM Output Program
-------------------------------------------------------------------
PALLWORK      Program to print country support worksheet for a standard
              22 product SWOPSIM model (model = NAME, country =CD)
REQUIREMENTS  Country model support spreadsheet file (NAMEsCD.CAL) on
              the model C:\NAME subdirectory.
OUTPUT        Multi-page printout of NAMEsCD.CAL
-------------------------------------------------------------------
COMMAND       PALLWORK  NAME  CD
-------------------------------------------------------------------
```

```
:PALLWORK
ECHO OFF
CLS
ECHO                SWOPSIM Output Program
ECHO ---------------------------------------------------------------------
ECHO PALLWORK       Program to print country support worksheet for a standard
ECHO                22 product SWOPSIM model (model = NAME, country =CD)
ECHO REQUIREMENTS   Country model support spreadsheet file (NAMEsCD.CAL) on
ECHO                the model C:\NAME subdirectory.
ECHO OUTPUT         Multi-page printout of NAMEsCD.CAL
ECHO ---------------------------------------------------------------------
ECHO COMMAND        PALLWORK  NAME  CD
ECHO ---------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: PALLWORK NAME CD
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country CoDe; Enter: PALLWORK NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1s%2.CAL GOTO C1
ECHO ERROR = The support spreadsheet %1s%2.CAL does not exist on C:\%1!
GOTO END
:C1
IF EXIST D:TEST.XQT ERASE D:TEST.XQT
CALL C:HPLASER SC3
COPY C:\%1\%1s%2.CAL D:
REM The following statement writes the SC5 macro to print out the worksheet.
ECHO {MACRO}{PANELOFF}{STATUS "Printing:
%1s%2"}/LD:%1s%2,A~/OPRA1:DH60~OBYQLP64~LO~TO~QQGQ/Q,Y >D:TEST.XQT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:%1s%2.CAL
:END ECHO ON
```

```
            Utility program for SWOPSIM and other uses.
-------------------------------------------------------------------
RWORD         Program which calls RWORD.EXE to replace a word in a
              selected ASCII file on the D: drive.
REQUIREMENTS  An ASCII file (FILE.EXT) on the D: drive, a WORD to be
              replaced, and a Replacement WORD.
INPUT         Enter file name (FILE.EXT), WORD to be replaced, and
              Replacement WORD.  Be sure to include the extenstion
              (e.g. .BAT) of the file on the D: drive.
OUTPUT (D:)   The same file on the D: drive with all WORDs replaced with
              RWORD.
-------------------------------------------------------------------
COMMAND       RWORD FILE.EXT WORD RWORD
-------------------------------------------------------------------
```

```
:RWORD
ECHO OFF
CLS
ECHO                Utility program for SWOPSIM and other uses.
ECHO ---------------------------------------------------------------------
ECHO RWORD          Program which calls RWORD.EXE to replace a word in a
ECHO                selected ASCII file on the D: drive.
ECHO REQUIREMENTS   An ASCII file (FILE.EXT) on the D: drive, a WORD to be
ECHO                replaced, and a Replacement WORD.
ECHO INPUT          Enter file name (FILE.EXT), WORD to be replaced, and
ECHO                Replacement WORD.  Be sure to include the extenstion
ECHO                (e.g. .BAT) of the file on the D: drive.
ECHO OUTPUT (D:)    The same file on the D: drive with all WORDs replaced with
ECHO                RWORD.
ECHO ---------------------------------------------------------------------
ECHO COMMAND        RWORD FILE.EXT WORD RWORD
ECHO ---------------------------------------------------------------------
IF EXIST D:\%1 GOTO C1
ECHO ERROR = D:%1 does not exist!
GOTO END
:C1
IF FILE%2 == FILE ECHO ERROR = WORD to be replaced? Enter: RWORD FILE.EXT WORD
RWORD
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = RWORD to replace? Enter: RWORD FILE.EXT WORD
RWORD
IF FILE%3 == FILE GOTO END
ECHO %1, %2, %3, >D:RWORD.TXT
C:\SWOPSIM\RWORD
ERASE D:RWORD.TXT
COPY D:OUT.ASC D:%1
ERASE D:OUT.ASC
:END ECHO ON
```

```
10 REM -RWORD - A program to Replace one WORD in an ASCII file
20 REM          residing on the D: drive.  It is call by
30 REM          RWORD.BAT.
40 CLS:PRINT
50 OFILE$="D:RWORD.TXT"
60 OPEN"I",1,OFILE$:INPUT #1,FILE$,WORD$,RWORD$:CLOSE 1 'Read file, word to be
replaced, and replacement word
70 IFILE$="D:"+FILE$
80 OFILE$="D:OUT.ASC"
90 OPEN"I",1,IFILE$
100 OPEN"O",2,OFILE$
110 IF EOF(1) THEN 160
120 LINE INPUT #1,W$
130 GOSUB 190
140 PRINT #2,W$
150 GOTO 110
160 CLOSE 1
170 CLOSE 2
180 SYSTEM
190 P0=INSTR(W$,WORD$):IF P0=0 THEN RETURN
200 W$=LEFT$(W$,P0-1)+RWORD$+RIGHT$(W$,LEN(W$)-LEN(WORD$)-P0+1)
210 GOTO 190
```

Program to write SC5 equation macro

EQWRITE	Program to convert SC5 content (PRN) File equations to SC5 macros which re-enter the equations in place.
REQUIREMENTS	SC5 contents File (FL.PRN) on D: drive.
OUTPUT (D:)	SC5 equation macro OUT.XQT.
COMMAND	EQWRITE FL

```
:EQWRITE
ECHO OFF
CLS
ECHO                Program to write SC5 equation macro
ECHO ---------------------------------------------------------------------
ECHO EQWRITE        Program to convert SC5 content file equations to SC5
ECHO                macros which re-enter the equations in place.
ECHO REQUIREMENTS   SC5 contents File on D: drive.  If a ~ is desired after
ECHO                macros, enter a ~ after the File name.
ECHO OUTPUT (D:)    SC5 equation macro OUT.XQT.
ECHO ---------------------------------------------------------------------
ECHO COMMAND        EQWRITE FL (~)
ECHO ---------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot File name; Enter: EQWRITE FL
IF FILE%1 == FILE GOTO END
ERASE D:OUT.XQT
COPY D:%1.PRN D:IN.PRN
ECHO %2, >D:TEST.PRN
C:\SWOPSIM\EQWRITE
ERASE D:IN.PRN
ERASE D:TEST.PRN
CLS
DIR D:*.XQT/W
:END ECHO ON
```

```
10 REM - EQWRITE - Write out SC5 macro for equations from SC5 contents file
20 REM             of equations
30 OPEN"I",1,"D:TEST.PRN"
40 INPUT #1,SQ$
50 CLOSE 1
60 OPEN"I",1,"D:IN.PRN"
70 OPEN"O",2,"D:OUT.XQT"
80 IF EOF(1) GOTO 230
90 LINE INPUT #1,L$
100 PRINT L$
110 W$=LEFT$(L$,15)
120 GOSUB 260:WW$=W$
130 E$=MID$(L$,INSTR(L$,"=")+1,LEN(L$)-INSTR(L$,"="))
140 W$=E$:GOSUB 260:E$=W$
150 IF LEN(E$)=0 OR E$="0" GOTO 80
160 W$="(BLANK "+WW$+")":GOSUB 300
170 GOSUB 290
180 W$="/FE"+WW$+",$":GOSUB 300
190 IF LEN(E$)<8 GOTO 80
200 W$="/P"+WW$
210 GOSUB 300
220 GOTO 80
230 CLOSE 1
240 CLOSE 2
250 END
260 LL=INSTR(W$," ") 'SUBROUTINE TO REMOVE BLANKS AND WRITE OUT STRING
270 IF LL=0 THEN RETURN
280 W$=LEFT$(W$,LL-1)+RIGHT$(W$,LEN(W$)-LL):GOTO 260
290 PRINT #2,"(LETC ";WW$;",";CHR$(34);E$;CHR$(34);")":RETURN
300 PRINT #2,W$;SQ$:RETURN
```

DEMO Replication Program

DEMOREPL	Program to REPLicate useful DEMO files for a chosen SWOPSIM model, NAME. DEMO is a 22 product DEMOnstration model. Files are replicated for output templates, batch programs, etc. for a structurally equivalent 22 product model, NAME.
REQUIREMENTS	The DEMO model must exist on the C:\DEMO subdirectory.
OUPUT (D:)	The output files will reside on the D: subdirectory. Batch files (*.BAT) must be copied manually to the C:\BATCH subdirectory while other files (e.g. *.XQT, *.CAL, etc.) must be copied manually to the C:\NAME model subdirectory.
COMMAND	DEMOREPL NAME

```
:DEMOREPL
ECHO OFF
CLS
ECHO                DEMO Replication Program
ECHO ------------------------------------------------------------------------
ECHO DEMOREPL       Program to REPLicate useful DEMO files for a chosen SWOPSIM
ECHO                model, NAME.  DEMO is a 22 product DEMOnstration model.
ECHO                Files are replicated for output templates, batch programs,
ECHO                etc. for a structurally equivalent 22 product model, NAME.
ECHO REQUIREMENTS   The DEMO model must exist on the C:\DEMO subdirectory.
ECHO OUPUT (D:)     The output files will reside on the D: subdirectory.  Batch
ECHO                files (*.BAT) must be copied manually to the C:\BATCH
ECHO                subdirectory while other files (e.g. *.XQT, *.CAL, etc.)
ECHO                must be copied manually to the C:\NAME model subdirectory.
ECHO ------------------------------------------------------------------------
ECHO COMMAND        DEMOREPL NAME
ECHO ------------------------------------------------------------------------
IF EXIST C:\DEMO\DEMO.PRN GOTO C1
ECHO ERROR = DEMO.PRN does not exist!
GOTO END
:C1
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: DEMOREPL NAME
IF FILE%1 == FILE GOTO END
PAUSE
IF EXIST D:*.TXT ERASE D:*.TXT
IF EXIST D:*.XQT ERASE D:*.XQT
IF EXIST D:*.CAL ERASE D:*.CAL
IF EXIST D:*.BAT ERASE D:*.BAT
COPY C:\%1\%1.PRN D:
ECHO %1, >D:SOUT.TXT
C:\SWOPSIM\SOUTLOOP
COPY D:TESTSOUT.TXT D:%1SOUT.BAT
ERASE D:SOUT.TXT
ERASE D:TESTSOUT.TXT
ERASE D:%1.PRN
COPY C:\DEMO\DEMOBLNK.TXT D:%1BLNK.TXT
COPY C:\DEMO\DEMOXQT.XQT D:%1XQT.XQT
COPY C:\DEMO\DEMOADD.CAL D:%1ADD.CAL
COPY C:\DEMO\DEMOSOUT.CAL D:%1SOUT.CAL
ECHO {MACRO}/LD:%1ADD,A~%1ADD~/S,O~/Q,Y >D:TEST.XQT
CALL SC D:TEST
ERASE D:TEST.XQT
COPY C:\DEMO\DEMOADD.XQT D:%1ADD.XQT
CALL RWORD %1ADD.XQT DEMO %1
IF EXIST C:\SC5.TXT GOTO C2
GOTO C3
:C2
COPY C:\DEMO\DEMOSUPD.CAL D:%1SUPD.CAL
IF EXIST C:\%1\%1bRW.CAL GOTO A1
GOTO A2
:A1
COPY C:\DEMO\DEMObRW.CAL D:
COPY C:\%1\%1bRW.CAL D:
ECHO {MACRO}/LD:%1SUPD,A~~ >D:TEST.XQT
ECHO {RSD}%1bRW~{ESC}~/SD:%1SUPD,O~/Q,Y~ >>D:TEST.XQT
CALL SC D:TEST.XQT
ERASE D:TEST.XQT
ERASE D:DEMObRW.CAL
ERASE D:%1bRW.CAL
:A2
COPY C:\DEMO\COMPARE.CAL D:
COPY C:\DEMO\CONVERT.CAL D:
COPY C:\DEMO\DEMOsTAX.* D:%1sTAX.*
COPY C:\DEMO\DEMOCOM3.XQT D:%1COM3.XQT
CALL RWORD %1COM3.XQT DEMO %1
COPY C:\DEMO\DEMOANAL.CAL D:%1ANAL.CAL
COPY C:\DEMO\DEMOBASE.CAL D:%1BASE.CAL
COPY C:\BATCH\DEMOROWC.BAT D:%1ROWC.BAT
CALL RWORD VIEW%1.BAT DEMO %1
COPY C:\BATCH\PACDEMO.BAT D:PAC%1.BAT
CALL RWORD PAC%1.BAT DEMO %1
COPY C:\BATCH\DEMOCOMP.BAT D:%1COMP.BAT
CALL RWORD %1COMP.BAT DEMO %1
COPY C:\BATCH\DEMOCOM3.BAT D:%1COM3.BAT
CALL RWORD %1COM3.BAT DEMO %1
:C3
CLS
DIR D: /W
:END ECHO ON
```

```
                Program to write SC5 equation macro
------------------------------------------------------------------------
FIXFORM         Program to FIX the FORMat of a set of model files for a
                country/region with CoDe CD.
REQUIREMENTS    Model NAME must have files on C:\NAME subdirectory.
OUTPUT (D:)     Files with fixed formats on D:
------------------------------------------------------------------------
COMMAND         FIXFORM NAME CD
------------------------------------------------------------------------

:FIXFORM
ECHO OFF
CLS
ECHO                Program to write SC5 equation macro
ECHO ------------------------------------------------------------------------
ECHO FIXFORM        Program to FIX the FORMat of a set of model files for a
ECHO                country/region with CoDe CD.
ECHO REQUIREMENTS   Model NAME must have files on C:\NAME subdirectory.
ECHO OUTPUT (D:)    Files with fixed formats on D:
ECHO ------------------------------------------------------------------------
ECHO COMMAND        FIXFORM NAME CD
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: FIXFORM NAME CD
```

```
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot country/region CoDe; Enter: FIXFORM
NAME CD
IF FILE%2 == FILE GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = %1.PRN does not exist on C:\%1 subdirectory.  Does the model NAME
exist?
GOTO END
:C1
IF EXIST C:\%1\%1b%2.CAL GOTO C2
ECHO ERROR = %1b%2.CAL does not exist on the C:\%1 subdirectory!
GOTO END
:C2
IF EXIST C:\SWOPSIM\FIXFORM.XQT GOTO C3
ECHO ERROR = The FIXFORM.XQT file does not exist on the C:\SWOPSIM subdirectory!
GOTO END
:C3
COPY C:\%1\%1b%2.CAL D:
IF EXIST D:TB.XQT ERASE D:TB.XQT
IF EXIST D:TE.XQT ERASE D:TE.XQT
ECHO {MACRO}{PANELOFF}{STATUS "FiXing FORMat for %1b%2.CAL"} >D:TB.XQT
ECHO /LD:%1b%2~A~ >>D:TB.XQT
ECHO /XD:TEST~ >>D:TB.XQT
COPY C:\SWOPSIM\FIXFORM.XQT D:TEST.XQT
ECHO {MACRO} >D:TE.XQT
ECHO /SD:%1b%2~OA~ >>D:TE.XQT
ECHO {BEEP} >>D:TE.XQT
ECHO /GKY~
ECHO /Q,Y~ >>D:TE.XQT
CALL SC D:TB
ERASE D:TEST.XQT
ERASE D:TB.XQT
ERASE D:TE.XQT
CLS
DIR D:%1b%2.CAL
:END ECHO ON
```

```
            SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGMOD       Program to aggregate model NAME country spreadsheets.
            Supply and demand elasticities are weighted by supply and
            demand quantities, respectively.  Quantities are added.
OUTPUT (D:) Aggregate spreadsheet named NAMEAMOD on D: drive which can
            be manually swopped with a newly created spreadsheet.
            Bring the new created spreadsheet to the D: drive and copy
            NAMEAMOD to replace it on the model subdirectory.  Then use
            the program BLANK to the bring NAMEAMOD elasticities into
            newly created sheet on the D: drive.  Remember to re-
            balance world net trade data in the RW region when aggregated
            data is used for an region in a new model.  Use TABLE to
            check the net trade data for a world balance.  Some
            variables may need to aggregated (perhaps with weights) by
            using the program AGVAR (which allows weighted aggregation
            of selected model variables).
-------------------------------------------------------------------------
COMMAND     AGMOD NAME
-------------------------------------------------------------------------
```

```
:AGMOD
ECHO OFF
CLS
ECHO              SWOPSIM Aggregation Program
ECHO -------------------------------------------------------------------------
ECHO AGMOD        Program to aggregate model NAME country spreadsheets.
ECHO              Supply and demand elasticities are weighted by supply and
ECHO              demand quantities, respectively.  Quantities are added.
ECHO OUTPUT (D:)  Aggregate spreadsheet named NAMEAMOD on D: drive which can
ECHO              be manually swopped with a newly created spreadsheet.
ECHO              Bring the new created spreadsheet to the D: drive and copy
ECHO              NAMEAMOD to replace it on the model subdirectory.  Then use
ECHO              the program BLANK to the bring NAMEAMOD elasticities into
ECHO              newly created sheet on the D: drive.  Remember to re-
ECHO              balance world net trade data in the RW region when aggregated
ECHO              data is used for an region in a new model.  Use TABLE to
ECHO              check the net trade data for a world balance.  Some
ECHO              variables may need to aggregated (perhaps with weights) by
ECHO              using the program AGVAR (which allows weighted aggregation
ECHO              of selected model variables).
ECHO -------------------------------------------------------------------------
ECHO COMMAND      AGMOD NAME
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: AGMOD NAME
IF FILE%1 == FILE GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = %1.PRN does not exist on the C:\%1 subdirectory.
GOTO END
:C1
IF EXIST D:%1AMOD.* ERASE D:%1AMOD.*
COPY C:\%1\%1.PRN D:
ECHO %1, >D:AGMOD.TXT
C:\SWOPSIM\AGMOD
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:AGMOD.TXT
ERASE D:%1.PRN
CLS
DIR D:/W
:END ECHO ON

10 REM - AGMOD - AGGREGATE COUNTRY/REGION SPREADSHEETS
20 CLS
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
40 WSQ$="~"
```

```
50 PRINT"Program to aggregate selected country/region spreadsheets."
60 PRINT"Elasticities, base data, and growth rates, etc. will be added"
70 PRINT"to aggregate spreadsheet.  The aggregate data is stored in the"
80 PRINT"spreadsheet AGMOD on the output directory"
90 PRINT:OFILE$=XO$+"AGMOD.TXT"
100 OPEN"I",1,OFILE$:INPUT #1,FILE$:CLOSE 1 'READ MODEL NAME
110 NAM$=FILE$+"b"
120 FILL$="b"
130 PRINT:PRINT"Reading master file - ";FILE$:PRINT
140 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 110 PRODUCT GROUPS
150 DIM CYM$(0,42),AG$(0,42) 'MASTER FILE CAN CONTAIN 41 COUNTRIES/REGIONS
160 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
170 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
180 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
190 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
200 LCL=LEN(CL$)/2
210 DIM CLM$(0,123)
220 FOR I=1 TO LCL '122 COLUMNS MAX.
230 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
240 OFILE$=XO$+FILE$+".PRN"
250 OPEN"I",1,OFILE$
260 DIM D(123,42)
270 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
280 LINE INPUT #1,W$
290 LINE INPUT #1,W$
300 LINE INPUT #1,W$
310 LINE INPUT #1,CY$
320 LINE INPUT #1,W$
330 STAR=(INSTR(CY$,"-")-11)/3
340 LCY=(LEN(CY$)-8)/3
350 IF STAR < LCY THEN LCY=STAR
360 PRINT:PRINT"Countries/regions are:":PRINT
370 FOR I=1 TO LCY
380 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
390 LPR=0
400 PRINT:PRINT"Product groups are:":PRINT
410 LPR=LPR+1
420 LINE INPUT#1,W$
430 WP$=MID$(W$,5,4)
440 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 460
450 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 440
460 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 540 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
470 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
480 X$=MID$(W$,(J-1)*3+9,3)
490 IF X$="  D" THEN X$="  2"
500 IF X$="  S" THEN X$="  3"
510 IF X$=" SD" OR X$=" DS" THEN X$="  4"
520 D(LPR,J)=VAL(X$):NEXT J
530 GOTO 410
540 CLOSE 1:LPR=LPR-1:IAG=0
550 CLS:PRINT" The country/regions are":PRINT
560 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
570 PRINT:PRINT" The country/regions included so far are:":PRINT
580 FOR I=1 TO IAG:PRINT AG$(0,I);" ";:NEXT I:PRINT
590 PRINT:INPUT"Enter 2 digit country/region code for aggregation ('Enter' when
done)";AGG$
600 IF AGG$=" " OR LEN(AGG$)=0 THEN 690
610 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
620 IF AGG$=CYM$(0,JC) THEN 650
630 NEXT JC
640 GOTO 550
650 FOR K=1 TO IAG:IF AGG$=AG$(0,K) THEN 570
660 NEXT K
670 IAG=IAG+1:AG$(0,IAG)=AGG$
680 GOTO 550
690 REM FIND POSITIONS OF MATRIX BLOCKS IN COUNTRY/REGION SPREADSHEETS
700 SB$="B 4" 'UPPER LEFT SUP. MATRIX
710 SE$=MID$(CL$,2*(LPR+1)-1,2)+STR$(3+LPR) 'LOWER RIGHT SUP. MATRIX
720 SOB$=MID$(CL$,2*(LPR+2)-1,2)+"4" 'UPPER LEFT DEM. VAR. MATRIX
730 ID=0:IS=0 'CHECK ON NUMBER OF QUANTITY VARIABLES
740 FOR I=1 TO LPR
750 IF D(I,LCY)=3 OR D(I,LCY)=4 THEN IS=IS+1
760 IF D(I,LCY)=2 OR D(I,LCY)=4 THEN ID=ID+1
770 NEXT I
780 SOE$=MID$(CL$,2*(LPR+1+IS)-1,2)+STR$(3+LPR) 'LOWER RIGHT DEMAND VAR. MATRIX
790 DB$=" B"+STR$(LPR+6) 'UPPER LEFT DEM. MATRIX
800 DE$=MID$(CL$,2*(LPR+1)-1,2)+STR$(2*LPR+5) 'LOWER RIGHT DEM. MATRIX
810 DOB$=MID$(CL$,2*(LPR+2)-1,2)+STR$(LPR+6) 'UPPER LEFT SUP. VAR. MATRIX
820 DOE$=MID$(CL$,2*(LPR+1+ID)-1,2)+STR$(2*LPR+5) 'LOWER RIGHT SUP. VAR. MATRIX
830 IF IS>ID THEN IMAX=IS ELSE IMAX=ID
840 QB$=" G"+STR$(2*LPR+9) 'UPPER LEFT SUPPLY QUANTITY
850 QE$=" H"+STR$(3*LPR+8) 'LOWER LEFT DEMAND QUANTITY
860 BL$=" B"+STR$(3*LPR+10) 'UPPER LEFT WORK AREA
870 BR$=MID$(CL$,2*(LPR+1+IMAX)-1,2)+STR$(4*LPR+9) 'LOWER RIGHT WORK AREA
880 BWT$=" A"+STR$(3*LPR+10) 'TOP OF WEIGHT COLUMN
890 BWB$=" A"+STR$(4*LPR+9) 'BOTTOM OF WEIGHT COLUMN
900 REM LOAD RW REGION, CHANGE NAME, AND BLANK OUT AREAS
910 PRINT:PRINT
920 PRINT:PRINT
930 NM$=""
940 NFILE$=FILE$+"AMOD"
950 PRINT
960 OFILE$=XO$+"TEST.XQT"
970 OPEN"O",1,OFILE$
980 W$="{MACRO}":GOSUB 2530
990 W$="{WINDOWSOFF}":GOSUB 2500
1000 W$="{PANELOFF}":GOSUB 2500
1010 W$="{STATUS "+CHR$(34)+"Aggregating "+FILE$+" models into:
"+NFILE$+CHR$(34)+"}":GOSUB 2500
1020 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 2500
1030 G$=XI$+FILE$+"\"
1040 W$="/L"+G$+FILE$+FILL$+"RW,A":GOSUB 2480
```

```
1050 W$="=A1":GOSUB 2480
1060 W$="/UA1:A1":GOSUB 2480
1070 W$=NFILE$:GOSUB 2470
1080 W$="/U"+BL$+":"+BR$:GOSUB 2480
1090 W$="/TC":GOSUB 2480
1100 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
1110 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
1120 W$="/U"+SB$+":"+SE$:GOSUB 2480
1130 W$="/B"+SB$+":"+SE$:GOSUB 2480
1140 IF SE$=SOE$ THEN 1170
1150 W$="/U"+SOB$+":"+SOE$:GOSUB 2480
1160 W$="/B"+SOB$+":"+SOE$:GOSUB 2480
1170 W$="/U"+DB$+":"+DE$:GOSUB 2480
1180 W$="/B"+DB$+":"+DE$:GOSUB 2480
1190 IF DE$=DOE$ THEN 1220
1200 W$="/U"+DOB$+":"+DOE$:GOSUB 2480
1210 W$="/B"+DOB$+":"+DOE$:GOSUB 2480
1220 W$="/U"+QB$+":"+QE$:GOSUB 2480
1230 W$="/B"+QB$+":"+QE$:GOSUB 2480
1240 BLB$=QB$:BRB$=QE$:GOSUB 2540
1250 BLB$=SB$:BRB$=SE$:GOSUB 2540
1260 IF SE$=SOE$ THEN 1280
1270 BLB$=SOB$:BRB$=SOE$:GOSUB 2540
1280 BLB$=DB$:BRB$=DE$:GOSUB 2540
1290 IF DE$=DOE$ THEN 1310
1300 BLB$=DOB$:BRB$=DOE$:GOSUB 2540
1310 BLB$=BL$:BRB$=BR$:GOSUB 2540
1320 BLB$=BWT$:BRB$=BWB$:GOSUB 2540
1330 W$="=T1":GOSUB 2480:W$="/U":GOSUB 2480:W$="0":GOSUB 2480
1340 W$="=X1":GOSUB 2480:W$="/U":GOSUB 2480:W$="0":GOSUB 2480
1350 W$="=M1":GOSUB 2480:W$="/U":GOSUB 2480:W$="0":GOSUB 2480
1360 W$="=P1":GOSUB 2480:W$="/U":GOSUB 2480:W$="0":GOSUB 2480
1370 FOR K=1 TO IAG 'LOAD INCOME & POPULATION
1380 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PT1:T1,T1,+":GOSUB 2480
1390 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PX1:X1,X1,+":GOSUB 2480
1400 NEXT K
1410 W$="=AA1":GOSUB 2480:W$="0":GOSUB 2480:W$="=AB1":GOSUB 2480:W$="0":GOSUB
2480:
1420 AMOD$="Aggregation ="
1430 FOR K=1 TO IAG 'AGGREGATE INCOME & POPULATION GROWTH RATES
1440 AMOD$=AMOD$+" +"+AG$(0,K)
1450 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PM1:M1,M1,V":GOSUB 2480
1460 W$="/UM1:M1":GOSUB 2480
1470 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PT1:T1,M1,*":GOSUB 2480
1480 W$="/CM1:M1,AA1,+":GOSUB 2480
1490 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PP1:P1,P1,V":GOSUB 2480
1500 W$="/UP1:P1":GOSUB 2480
1510 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",PX1:X1,P1,*":GOSUB 2480
1520 W$="/CP1:P1,AB1,+":GOSUB 2480
1530 NEXT K
1540 W$="/CAA1:AA1,M1":GOSUB 2480
1550 W$="/CT1:T1,M1,/":GOSUB 2480
1560 W$="/CAB1:AB1,P1":GOSUB 2480
1570 W$="/CX1:X1,P1,/":GOSUB 2480
1580 W$="/BAA1:AA1":GOSUB 2480
1590 W$="/BAB1:AB1":GOSUB 2480
1600 FOR K=1 TO IAG 'LOAD QUANTITIES
1610 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QB$+":"+QE$+","+QB$+",+":GOSUB 2480
1620 NEXT K
1630 QAB$="AG"+STR$(2*LPR+9):QAE$="AG"+STR$(3*LPR+8) 'AGGREGATE SUPPLY GROWTH
RATES
1640 QWB$=" G"+STR$(2*LPR+9):QWE$=" G"+STR$(3*LPR+8)
1650 BLB$=QAB$:BRB$=QAE$:GOSUB 2540:BLB$=BWT$:BRB$=BWB$:GOSUB 2540
1660 FOR K=1 TO IAG
1670 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
1680 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
1690 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QAB$+":"+QAE$+","+BWT$+",V":GOSUB 2480
1700 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QWB$+":"+QWE$+","+BWT$+",*":GOSUB 2480
1710 W$="/C"+BWT$+":"+BWB$+","+QAB$+",+":GOSUB 2480
1720 NEXT K
1730 W$="/C"+QWB$+":"+QWE$+","+QAB$+",/":GOSUB 2480
1740 QAB$="AH"+STR$(2*LPR+9):QAE$="AH"+STR$(3*LPR+8) 'AGGREGATE INCOME
ELASTICITIES
1750 QWB$=" H"+STR$(2*LPR+9):QWE$=" H"+STR$(3*LPR+8)
1760 BLB$=QAB$:BRB$=QAE$:GOSUB 2540:BLB$=BWT$:BRB$=BWB$:GOSUB 2540
1770 FOR K=1 TO IAG
1780 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
1790 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
1800 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QAB$+":"+QAE$+","+BWT$+",V":GOSUB 2480
1810 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QWB$+":"+QWE$+","+BWT$+",*":GOSUB 2480
1820 W$="/C"+BWT$+":"+BWB$+","+QAB$+",+":GOSUB 2480
1830 NEXT K
1840 W$="/C"+QWB$+":"+QWE$+","+QAB$+",/":GOSUB 2480
1850 QAB$="AI"+STR$(2*LPR+9):QAE$="AI"+STR$(3*LPR+8) 'AGGREGATE PRICE
TRANSMISSION ELASTICITIES
1860 QWB$=" G"+STR$(2*LPR+9):QWE$=" G"+STR$(3*LPR+8)
1870 BLB$=BWT$:BRB$=BWB$:GOSUB 2540
1880 BLB$=QAB$:BRB$=QAE$:GOSUB 2540:BLB$=BWT$:BRB$=BWB$:GOSUB 2540
1890 FOR K=1 TO IAG
1900 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
1910 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
1920 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QAB$+":"+QAE$+","+BWT$+",V":GOSUB 2480
1930 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QWB$+":"+QWE$+","+BWT$+",*":GOSUB 2480
1940 W$="/C"+BWT$+":"+BWB$+","+QAB$+",+":GOSUB 2480
1950 NEXT K
1960 W$="/C"+QWB$+":"+QWE$+","+QAB$+",/":GOSUB 2480
1970 FOR K=1 TO IAG 'AGGREGATE SUPPLY ELASTICITIES
1980 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
1990 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
2000
W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+QB$+":"+"G"+STR$(3*LPR+8)+","+BWT$+",V":GOS
UB 2480
2010 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
2020 W$="/C"+QB$+":"+"G"+STR$(3*LPR+8)+","+BWT$+",/":GOSUB 2480
```

```
2030 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
2040 CR$=LEFT$(SOE$,2)+RIGHT$(BL$,LEN(BL$)-2)
2050 W$="/U"+BL$+":"+BR$:GOSUB 2480
2060 W$="/B"+BL$+":"+BR$:GOSUB 2480
2070 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+SB$+":"+SOE$+","+BL$+",V":GOSUB 2480
2080 W$="/U"+BL$+":"+BR$:GOSUB 2480
2090 W$="/R"+BWT$+":"+BWB$+","+BL$+":"+CR$+",*":GOSUB 2480
2100 W$="/C"+BL$+":"+BR$+","+SB$+",+":GOSUB 2480
2110 W$="/FE"+SB$+":"+SOE$+",$":GOSUB 2480
2120 NEXT K
2130 W$="/DR,"+STR$(3*LPR+10)+":"+STR$(4*LPR+9):GOSUB 2480
2140 W$="/P"+SB$+":"+SOE$:GOSUB 2480
2150 FOR K=1 TO IAG 'AGGREGATE DEMAND ELASTICITIES
2160 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
2170 W$="/B"+BWT$+":"+BWB$:GOSUB 2480
2180
W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+"H"+STR$(2*LPR+9)+":"+QE$+","+BWT$+",V":GOS
UB 2480
2190 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
2200 W$="/C"+"H"+STR$(2*LPR+9)+":"+QE$+","+BWT$+",/":GOSUB 2480
2210 W$="/U"+BWT$+":"+BWB$:GOSUB 2480
2220 CR$=LEFT$(DOE$,2)+RIGHT$(BL$,LEN(BL$)-2)
2230 W$="/U"+BL$+":"+BR$:GOSUB 2480
2240 W$="/B"+BL$+":"+BR$:GOSUB 2480
2250 W$="/L"+G$+FILE$+FILL$+AG$(0,K)+",P"+DB$+":"+DOE$+","+BL$+",V":GOSUB 2480
2260 W$="/U"+BL$+":"+BR$:GOSUB 2480
2270 W$="/R"+BWT$+":"+BWB$+","+BL$+":"+CR$+",*":GOSUB 2480
2280 W$="/C"+BL$+":"+BR$+","+DB$+",+":GOSUB 2480
2290 W$="/FE"+DB$+":"+DOE$+",$":GOSUB 2480
2300 NEXT K
2310 W$="/DR,"+STR$(3*LPR+10)+":"+STR$(4*LPR+9):GOSUB 2480
2320 W$="/P"+DB$+":"+DOE$:GOSUB 2480
2330 W$="/P"+QB$+":"+QE$:GOSUB 2480
2340 W$="=B2":GOSUB 2480
2350 W$=AMOD$+" from model: "+FILE$:GOSUB 2500
2360 W$="/FE,TL":GOSUB 2480
2370 W$="=A1":GOSUB 2480
2380 W$="!":GOSUB 2480
2390 W$="/UA1:CZ200":GOSUB 2480
2400 W$="/DR"+STR$(9+3*LPR)+":"+STR$(11+4*LPR):GOSUB 2480
2410 W$="/S"+XO$+FILE$+"AMOD,V":GOSUB 2480
2420 W$="{BEEP 2}":GOSUB 2500
2430 W$="/Q,Y":GOSUB 2500
2440 CLOSE 1
2450 SYSTEM
2460 END
2470 GOSUB 2480:PRINT #1,"/P";WSQ$:RETURN 'WRITE TO SHEET AND PROTECT CELL
2480 P0=INSTR(W$," "):IF P0=0 THEN 2500
2490 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 2480
2500 PRINT #1,W$;WSQ$:RETURN 'WRITE TO SHEET
2510 GOSUB 2480:PRINT #1,"/FE,$";WSQ$:PRINT #1,"/P";WSQ$:RETURN 'WRITE TO SHEET,
PROTECT AND USE $ FORMAT
2520 GOSUB 2480:PRINT #1,"/FE,I";WSQ$:PRINT #1,"/P";WSQ$:RETURN 'WRITE TO SHEET,
PROTECT AND USE INTEGER FORMAT
2530 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
2540 REM SUBROUTINE TO FILL A BLOCK WITH ZEROS
2550 W$="="+BLB$:GOSUB 2480
2560 W$="0":GOSUB 2480
2570
W$="/R"+BLB$+":"+BLB$+","+BLB$+":"+LEFT$(BRB$,2)+RIGHT$(BLB$,LEN(BLB$)-2):GOSUB
2480
2580
W$="/R"+BLB$+":"+LEFT$(BRB$,2)+RIGHT$(BLB$,LEN(BLB$)-2)+","+BLB$+":"+LEFT$(BLB$,
2)+RIGHT$(BRB$,LEN(BRB$)-2):GOSUB 2480
2590 RETURN
```

```
                SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGSUP           Program to aggregate support expenditure estimates in
                model NAME support worksheets.
OUTPUT (D:)     Aggregate support worksheet NAMEASUP.  This spreadsheet
                must be saved to the new model subdirectory.where the
                aggregate support is to be used.  Then the WORK program
                must be run to update the new aggregate worksheet.
-------------------------------------------------------------------------
COMMAND         AGSUP NAME
-------------------------------------------------------------------------
```

```
:AGSUP
ECHO OFF
CLS
ECHO                SWOPSIM Aggregation Program
ECHO -------------------------------------------------------------------------
ECHO AGSUP          Program to aggregate support expenditure estimates in
ECHO                model NAME support worksheets.
ECHO OUTPUT (D:)    Aggregate support worksheet NAMEASUP.  This spreadsheet
ECHO                must be saved to the new model subdirectory where the
ECHO                aggregate support is to be used.  Then the WORK program
ECHO                must be run to update the new aggregate worksheet.
ECHO -------------------------------------------------------------------------
ECHO COMMAND        AGSUP NAME
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE  ECHO ERROR = You forgot master NAME; Enter: AGSUP NAME
IF FILE%1 == FILE  GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = Model %1 does not exist on the c:\%1 subdirectory.
GOTO END
:C1
IF EXIST C:\%1\%1sRW.CAL GOTO C2
ECHO ERROR = RW support spreadsheet does not exist on C:\%1 subdirctory.
GOTO END
:C2
IF EXIST D:%1ASUP.CAL ERASE D:%1ASUP.CAL
```

```
COPY C:\%1\%1.PRN D:
ECHO %1, >D:AGSUP.TXT
C:\SWOPSIM\AGSUP
CALL C:SC D:TEST
ERASE D:T.CAL
ERASE D:TEST.XQT
ERASE D:AGSUP.TXT
ERASE D:%1.PRN
CLS
DIR D:/W
:END ECHO ON
```

```
10 REM - AGSUP - AGGREGATE COUNTRY/REGION SUPPORT SPREADSHEET 'BUDGET' DATA
20 CLS
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FL
40 WSQ$="~"
50 PRINT"Program to aggregate selected support worksheet 'budget' data."
60 PRINT"Dollar value of support data will be added to aggregate"
70 PRINT"spreadsheet for the selected aggregate regions.  The support"
80 PRINT"worksheet for the aggregate region must already exist on a "
90 PRINT"subdirectory.
100 PRINT:OFILE$=XO$+"AGSUP.TXT"
110 OPEN"I",1,OFILE$:INPUT #1,FILE$:CLOSE 1 'READ MODEL NAME
120 FILEM$=FILE$
130 NAM$=FILE$+"b"
140 PRINT:PRINT"Reading master file - ";FILE$:PRINT
150 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 110 PRODUCT GROUPS
160 DIM CYM$(0,42),AG$(0,42) 'MASTER FILE CAN CONTAIN 41 COUNTRIES/REGIONS
170 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
180 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
190 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
200 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
210 LCL=LEN(CL$)/2
220 DIM CLM$(0,123)
230 FOR I=1 TO LCL '122 COLUMNS MAX.
240 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
250 OFILE$=XO$+FILE$+".PRN"
260 OPEN"I",1,OFILE$
270 DIM D(123,42)
280 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
290 LINE INPUT #1,W$
300 LINE INPUT #1,W$
310 LINE INPUT #1,W$
320 LINE INPUT #1,CY$
330 LINE INPUT #1,W$
340 STAR=(INSTR(CY$,"-")-11)/3
350 LCY=(LEN(CY$)-8)/3
360 IF STAR < LCY THEN LCY=STAR
370 PRINT:PRINT FILE$;" countries/regions are:":PRINT
380 FOR I=1 TO LCY
390 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
400 LPR=0
410 PRINT:PRINT"Product groups are:":PRINT
420 LPR=LPR+1
430 LINE INPUT#1,W$
440 WP$=MID$(W$,5,4)
450 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 470
460 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 450
470 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 550 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
480 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
490 X$=MID$(W$,(J-1)*3+9,3)
500 IF X$="  D" THEN X$="  2"
510 IF X$="  S" THEN X$="  3"
520 IF X$=" SD" OR X$=" DS" THEN X$="  4"
530 D(LPR,J)=VAL(X$):NEXT J
540 GOTO 420
550 CLOSE 1:LPR=LPR-1:IAG=0
560 CLS:PRINT FILE$;" country/regions are":PRINT
570 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
580 PRINT:PRINT" The country/regions included so far are:":PRINT
590 FOR I=1 TO IAG:PRINT AG$(0,I);" ";:NEXT I:PRINT
600 PRINT:INPUT"Enter 2 digit country/region code for aggregation ('ENTER' when
done)";AGG$
610 IF AGG$=" " OR LEN(AGG$)=0 THEN 700
620 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
630 IF AGG$=CYM$(0,JC) THEN 660
640 NEXT JC
650 GOTO 560
660 FOR K=1 TO IAG:IF AGG$=AG$(0,K) THEN 580
670 NEXT K
680 IAG=IAG+1:AG$(0,IAG)=AGG$
690 GOTO 560
700 REM
710 ID=0:IS=0 'CHECK ON NUMBER OF QUANTITY VARIABLES
720 FOR I=1 TO LPR
730 IF D(I,LCY)=3 OR D(I,LCY)=4 THEN IS=IS+1
740 IF D(I,LCY)=2 OR D(I,LCY)=4 THEN ID=ID+1
750 NEXT I
760 CB$=STR$(6+LPR)
770 PRINT:PRINT
780 PRINT:PRINT
790 PRINT:NM$="ASUP"
800 OFILE$=XO$+"TEST.XQT"
810 OPEN"O",1,OFILE$
820 W$="{MACRO}":GOSUB 1450
830 W$="{WINDOWSOFF}":GOSUB 1440
840 W$="{PANELOFF}":GOSUB 1440
850 W$="{STATUS "+CHR$(34)+"Aggregating support data into worksheet:
"+FILEM$+NM$+CHR$(34)+"}":GOSUB 1440
860 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1440
870 G$=XI$+FILE$+"\"
880 FOR I=1 TO LPR
```

```
890 W$="=A"+STR$(I):GOSUB 1420
900 W$="0":GOSUB 1420
910 W$="=B"+STR$(I):GOSUB 1420
920 W$="0":GOSUB 1420
930 W$="=C"+STR$(I):GOSUB 1420
940 W$="0":GOSUB 1420
950 W$="=D"+STR$(I):GOSUB 1420
960 W$="0":GOSUB 1420
970 W$="=J"+STR$(I):GOSUB 1420
980 W$="0":GOSUB 1420
990 W$="=K"+STR$(I):GOSUB 1420
1000 W$="0":GOSUB 1420
1010 W$="=M"+STR$(I):GOSUB 1420
1020 W$="0":GOSUB 1420
1030 NEXT I
1040 W$="=A1":GOSUB 1420
1050 RT$=STR$(LPR+17) 'CALCULATE BOTTOM TOP ROW NUMBER
1060 RB$=STR$(2*LPR+16) 'CALCULATE BOTTOM TOP ROW NUMBER
1070 FOR K=1 TO IAG 'AGGREGATE DOLLAR VALUE OF SUPPORT
1080 W$="/L"+G$+FILE$+"s"+AG$(0,K)+",PCU"+RT$+":CX"+RB$+",F1,V":GOSUB 1420
1090 W$="/L"+G$+FILE$+"s"+AG$(0,K)+",PK1:K1,E1,V":GOSUB 1420
1100 W$="/UE1:I"+STR$(LPR):GOSUB 1420
1110 W$="/CE1,E2:E"+STR$(LPR):GOSUB 1420
1120 W$="/CE1:E"+STR$(LPR)+",F1:I1,/":GOSUB 1420
1130 W$="/CF1:I"+STR$(LPR)+",A1,+":GOSUB 1420
1140 W$="/L"+G$+FILE$+"s"+AG$(0,K)+",PAE"+RT$+":AE"+RB$+",J1,+":GOSUB 1420
1150 W$="/UJ1:J"+STR$(LPR):GOSUB 1420
1160 W$="/UL1:L"+STR$(LPR):GOSUB 1420
1170 W$="/BL1:L"+STR$(LPR):GOSUB 1420
1180 W$="/L"+G$+FILE$+"s"+AG$(0,K)+",PAH"+RT$+":AH"+RB$+",L1,V":GOSUB 1420
1190 W$="/UL1:L"+STR$(LPR):GOSUB 1420
1200 W$="/CE1:E"+STR$(LPR)+",L1,/":GOSUB 1420
1210 W$="/L"+G$+FILE$+"s"+AG$(0,K)+",PAE"+RT$+":AE"+RB$+",L1,*":GOSUB 1420
1220 W$="/CL1:L"+STR$(LPR)+",M1,+":GOSUB 1420
1230 NEXT K
1240 W$="/CJ1:J"+STR$(LPR)+",M1,/":GOSUB 1420
1250 W$="/SD:T,V":GOSUB 1420
1260 W$="/Z,Y":GOSUB 1420
1270 W$="/L"+G$+FILE$+"sRW,R":GOSUB 1420
1280 W$="/UAE"+RT$+":AH:+RB$:GOSUB 1430
1290 W$="/BAE"+RT$+":AH:+RB$:GOSUB 1430
1300 W$="/BCU"+CT$+":CX:+RB$:GOSUB 1430
1310 W$="/LD:T,PA1:D"+STR$(LPR)+",CU"+RT$:GOSUB 1420
1320 W$="/LD:T,PJ1:J"+STR$(LPR)+",AE"+RT$:GOSUB 1420
1330 W$="/LD:T,PM1:M"+STR$(LPR)+",AH"+RT$:GOSUB 1420
1340 W$="/UAE"+RT$+":AH:+RB$:GOSUB 1430
1350 W$="/SD:"+FILE$+"ASUP":GOSUB 1420
1360 W$="{BEEP 2}":GOSUB 1440
1370 W$="/Q,Y":GOSUB 1440
1380 CLOSE 1
1390 SYSTEM
1400 END
```



```
1410 GOSUB 1420:PRINT #1,"/P";WSQ$:RETURN 'WRITE TO SHEET AND PROTECT CELL
1420 PO=INSTR(W$," "):IF PO=0 THEN 1440
1430 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 1420
1440 PRINT #1,W$;WSQ$:RETURN 'WRITE TO SHEET
1450 PRINT #1,W$:RETURN 'PRINT WITHOUT WSQ$
```

```
                SWOPSIM Aggregation Program
-------------------------------------------------------------------------
AGDAT           Program to aggregate base spreadsheet DATa (imports,
                exports, supply, demand) across countries/regions in a
                model file NAME.
OUTPUT (D:)     Aggregate file NAMEADAT.  This file must be re-named and
                copied to new model subdirectory.
-------------------------------------------------------------------------
COMMAND         AGDAT NAME
-------------------------------------------------------------------------
```

```
:AGDAT
ECHO OFF
CLS
ECHO                SWOPSIM Aggregation Program
ECHO -------------------------------------------------------------------------
ECHO AGDAT          Program to aggregate base spreadsheet DATa (imports,
ECHO                exports, supply, demand) across countries/regions in a
ECHO                model file NAME.
ECHO OUTPUT (D:)    Aggregate file NAMEADAT.  This file must be re-named and
ECHO                copied to new model subdirectory.
ECHO -------------------------------------------------------------------------
ECHO COMMAND        AGDAT NAME
ECHO -------------------------------------------------------------------------
IF FILE%1 == FILE  ECHO ERROR = You forgot model NAME; Enter: AGDAT NAME
IF FILE%1 == FILE  GOTO END
IF EXIST C:\%1\%1tRW.CAL GOTO C1
ECHO ERROR = %1tRW.CAL does not exist on c:\%1 subdirectory.  Check for
existence
ECHO          of base data files for model %1.
GOTO END
:C1
IF EXIST D:%1AGDAT.CAL ERASE D:%1AGDAT.CAL
COPY C:\%1\%1.PRN D:
ECHO %1, >D:AGDAT.TXT
C:\SWOPSIM\AGDAT
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:AGDAT.TXT
ERASE D:%1.PRN
DIR D:/W
:END ECHO ON
```

```
10 REM - AGDAT - AGGREGATE COUNTRY/REGION BASE DATA
20 CLS
```

```
30 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT OUTPUT FILE
40 WSO$="~"
50 PRINT"Program to aggregate base data.":PRINT
60 PRINT"Quantity import, export, supply, and demand data will be added to
aggregate"
70 PRINT"spreadsheet for the selected countries/regions."
80 PRINT:OFILE$=XO$+"AGDAT.TXT"
90 OPEN"I",1,OFILE$:INPUT #1,FILE$,FILEM$:CLOSE 1 'READ MODEL NAME
100 PRINT:PRINT"READING MASTER FILE - ";FILE$:PRINT
110 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN PERHAPS UP TO 110 PRODUCT GROUPS
120 DIM CYM$(0,42),AG$(0,42) 'MASTER FILE CAN CONTAIN 41 COUNTRIES/REGIONS
130 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
140 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
150 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
160 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
170 LCL=LEN(CL$)/2
180 DIM CLM$(0,123)
190 FOR I=1 TO LCL '122 COLUMNS MAX.
200 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
210 OFILE$=XO$+FILE$+".PRN"
220 OPEN"I",1,OFILE$
230 DIM D(123,42)
240 LINE INPUT #1,W$ 'BEGIN READING TLIB.PRN MASTER FILE
250 LINE INPUT #1,W$
260 LINE INPUT #1,W$
270 LINE INPUT #1,W$
280 LINE INPUT #1,CY$
290 LINE INPUT #1,W$
300 STAR=(INSTR(CY$,"-")-11)/3
310 LCY=(LEN(CY$)-8)/3
320 IF STAR < LCY THEN LCY=STAR
330 PRINT:PRINT" Countries/regions are:":PRINT
340 FOR I=1 TO LCY
350 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):PRINT CYM$(0,I);" ";:NEXT I:PRINT
360 LPR=0
370 PRINT:PRINT"Product groups are:":PRINT
380 LPR=LPR+1
390 LINE INPUT#1,W$
400 WP$=MID$(W$,5,4)
410 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 430
420 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 410
430 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 510 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
440 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
450 X$=MID$(W$,(J-1)*3+9,3)
460 IF X$="  D" THEN X$="  2"
470 IF X$="  S" THEN X$="  3"
480 IF X$=" SD" OR X$=" DS" THEN X$="  4"
490 D(LPR,J)=VAL(X$):NEXT J
500 GOTO 380
510 CLOSE 1:LPR=LPR-1:IAG=0
520 CLS:PRINT" The countries/regions are":PRINT
530 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
540 PRINT:PRINT" The countries/regions included so far are:":PRINT
550 FOR I=1 TO IAG:PRINT AG$(0,I);" ";:NEXT I:PRINT
560 PRINT:INPUT"Enter 2 digit country/region CoDe for aggregation ('Enter' when
done)";AGG$
570 IF AGG$=" " OR LEN(AGG$)=0 THEN 660
580 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
590 IF AGG$=CYM$(0,JC) THEN 620
600 NEXT JC
610 GOTO 520
620 FOR K=1 TO IAG:IF AGG$=AG$(0,K) THEN 540
630 NEXT K
640 IAG=IAG+1:AG$(0,IAG)=AGG$
650 GOTO 520
660 REM
670 ID=0:IS=0 'CHECK ON NUMBER OF QUANTITY VARIABLES
680 FOR I=1 TO LPR
690 IF D(I,LCY)=3 OR D(I,LCY)=4 THEN IS=IS+1
700 IF D(I,LCY)=2 OR D(I,LCY)=4 THEN ID=ID+1
710 NEXT I
720 CB$=STR$(6+LPR)
730 PRINT:PRINT
740 PRINT:PRINT
750 NM$=FILE$+"ADAT"
760 OFILE$=XO$+"TEST.XQT"
770 OPEN"O",1,OFILE$
780 W$="{MACRO}":GOSUB 1250
790 W$="{WINDOWSOFF}":GOSUB 1240
800 W$="{PANELOFF}":GOSUB 1240
810 W$="{STATUS "+CHR$(34)+" Aggregating "+FILE$+"t** files into:
"+FILE$+"ADAT"+CHR$(34)+"}":GOSUB 1240
820 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1240
830 G$=XI$+FILE$+"\"+FILE$+"t"
840 W$="=A1":GOSUB 1220
850 W$="/L"+XI$+FILE$+"\"+FILE$+"tRW,PA1:M"+STR$(2+LPR)+",A1,V":GOSUB 1220
860 W$="=A1":GOSUB 1220
870 W$="/UA1:A2":GOSUB 1220
880 W$="/BA2":GOSUB 1220
890 W$="/UB1:D2":GOSUB 1220
900 W$="/FEB1:D2,TR":GOSUB 1220
910 W$="/PB1:D2":GOSUB 1220
920 BT$=STR$(2+LPR)
930 W$="/UB3:F"+BT$:GOSUB 1220
940 W$="/BB3:F"+BT$:GOSUB 1220
950 W$=NM$:GOSUB 1220
960 W$="=B3":GOSUB 1220:W$="0":GOSUB 1220
970 W$="=C3":GOSUB 1220:W$="0":GOSUB 1220
980 W$="=D3":GOSUB 1220:W$="0":GOSUB 1220
990 W$="=E3":GOSUB 1220:W$="0":GOSUB 1220
1000 W$="=F3":GOSUB 1220:W$="0":GOSUB 1220
1010 W$="/RB3:F3,B4:B"+BT$:GOSUB 1220
```

```
1020 AGMX$="Aggregation = "
1030 W$="=A1":GOSUB 1220
1040 FOR K=1 TO IAG
1050 W$=AGMX$+" +"+AG$(0,K)
1060 AGMX$=AGMX$+" +"+AG$(0,K)
1070 CAG$=AG$(0,K)
1080 W$="/L"+G$+CAG$+",PB3:F"+BT$+",B3,+":GOSUB 1220
1090 W$="/UB3:F"+BT$:GOSUB 1220
1100 NEXT K
1110 W$="=H1":GOSUB 1240
1120 W$=AGMX$+" from model: "+FILE$:GOSUB 1240
1130 W$="/FE,TL":GOSUB 1240
1140 W$="=A1":GOSUB 1220
1150 W$="/FEB3:F"+BT$+",G":GOSUB 1220
1160 W$="/S"+XO$+FILE$+"ADAT,A":GOSUB 1220
1170 W$="/O,Y":GOSUB 1250
1180 CLOSE 1
1190 SYSTEM
1200 END
1210 GOSUB 1220:PRINT #1,"/P":RETURN 'WRITE TO SHEET AND PROTECT CELL
1220 P0=INSTR(W$," "):IF P0=0 THEN 1240
1230 W$=LEFT$(W$,P0-1)+RIGHT$(W$,LEN(W$)-P0):GOTO 1220
1240 PRINT #1,W$;WSO$:RETURN 'WRITE TO SHEET
1250 PRINT #1,W$:RETURN 'WRITE TO SHEET
```

```
                SWOPSIM Aggregation Program
-------------------------------------------------------------------
AGVAR           Program to aggregate a selected variable(s) from a
                country model base data spreadsheet, a world model
                solution spreadsheet, or a country support spreadsheet.
                Note that if you want to aggregate variables from a world
                model solution, you must use the LOOP program with SOUT to
                get solution files for each country.
OUTPUT (D:)     Spreadsheet on D: drive named AGVAR
-------------------------------------------------------------------
COMMAND         AGVAR NAME
-------------------------------------------------------------------
```

```
:AGVAR
ECHO OFF
CLS
ECHO                SWOPSIM Aggregation Program
ECHO -------------------------------------------------------------------
ECHO AGVAR          Program to aggregate a selected variable(s) from a
ECHO                country model base data spreadsheet, a world model
ECHO                solution spreadsheet, or a country support spreadsheet.
ECHO                Note that if you want to aggregate variables from a world
ECHO                model solution, you must use the LOOP program with SOUT to
ECHO                get solution files for each country.
ECHO OUTPUT (D:)    Spreadsheet on D: drive named AGVAR
ECHO -------------------------------------------------------------------
ECHO COMMAND        AGVAR NAME
ECHO -------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model name; Enter: AGVAR NAME
IF FILE%1 == FILE  GOTO END
IF EXIST C:\%1\%1.PRN GOTO C1
ECHO ERROR = %1.PRN file does not exist on C:\%1 subdirectory!
GOTO END
:C1
IF EXIST D:AGVAR.CAL ERASE D:AGVAR.CAL
COPY C:\%1\%1.PRN D:
ECHO %1, >D:AGVAR.TXT
C:\SWOPSIM\AGVAR
CALL C:SC D:TEST
ERASE D:TEST.XQT
ERASE D:AGVAR.TXT
ERASE D:%1.PRN
DIR D:/W
:END ECHO ON
```

```
10 REM - AGVAR - AGGREGATE A VARIABLE (OR BLOCK OF VARIABLES) ACROSS
COUNTRY/REGION DATA SHEETS, A WORLD MODEL SHEET, OR COUNTRY/REGION SUPPORT
SHEETS
20 REM COUNTRY/REGION SPREADSHEETS
30 CLS 'AGGREGATE SELECTED PARTS OF COUNTRY/REGION FILES
40 OPEN"I",1,"INOUT.TXT":INPUT #1,XI$,XO$,XR$:CLOSE 1 'READ INPUT-OUT. FILE
50 WSO$="~"
60 PRINT:PRINT"Program to aggregate selected variable(s) from country models,"
70 PRINT"world model solutions, or country support worksheets":PRINT
80 OFILE$=XO$+"AGVAR.TXT"
90 PRINT:OPEN"I",1,OFILE$:INPUT #1,FILE$:CLOSE 1 'READ MODEL NAME
100 NAM$=FILE$+"b"
110 PRINT:PRINT"Reading master file - ";FILE$:PRINT
120 DIM PRM$(0,123) 'MASTER FILE CAN CONTAIN ABOUT UP TO 110 PRODUCT GROUPS
130 DIM CYM$(0,42) 'MASTER FILE CAN CONTAIN UP TO 41 COUNTRIES/REGIONS
140 CL$=" A B C D E F G H I J K L M N O P Q R S T U V W X Y ZAAABACADAEAFAGAH"
150 CL$=CL$+"AIAJAKALAMANAOAPAQARASATAUAVAWAXAYAZBABBBCBDBEBFBGBHBIBJBKBLBMBN"
160 CL$=CL$+"BOBPBQBRBSBTBUBVBWBXBYBZCACBCCCDCECFCGCHCICJCKCLCMCNCOCPCQCRCSCT"
170 CL$=CL$+"CUCVCWCXCYCZDADBDCDDDEDFDGDHDIDJDKDLDMDNDODPDQDR"
180 LCL=LEN(CL$)/2
190 DIM CLM$(0,123)
200 FOR I=1 TO LCL '122 COLUMNS MAX.
210 CLM$(0,I)=MID$(CL$,(I-1)*2+1,2):NEXT I
220 OFILE$=XO$+FILE$+".PRN"
230 OPEN"I",1,OFILE$
240 DIM D(123,42)
250 LINE INPUT #1,W$ 'BEGIN READING .PRN MASTER FILE
260 LINE INPUT #1,W$
270 LINE INPUT #1,W$
280 LINE INPUT #1,W$
290 LINE INPUT #1,CY$
300 LINE INPUT #1,W$
310 STAR=(INSTR(CY$,"-")-11)/3
```

```
320 LCY=(LEN(CY$)-8)/3
330 IF STAR < LCY THEN LCY=STAR
340 FOR I=1 TO LCY
350 CYM$(0,I)=MID$(CY$,(I-1)*3+10,2):NEXT I
360 LPR=0
370 PRINT:PRINT"Product groups are:":PRINT
380 LPR=LPR+1
390 LINE INPUT#1,W$
400 WP$=MID$(W$,5,4)
410 PBLANK=INSTR(WP$," "):IF PBLANK=0 THEN 430
420 WP$=RIGHT$(WP$,LEN(WP$)-1):GOTO 410
430 IF MID$(W$,7,2)=" ^" OR MID$(W$,7,2)="  " THEN 510 ELSE
PRM$(0,LPR)=WP$:PRINT PRM$(0,LPR);" ";
440 FOR J=1 TO LCY 'PUT ONE, TWO, THREE, FOUR OR ZERO IN D MATRIX FOR EACH ROW
450 X$=MID$(W$,(J-1)*3+9,3)
460 IF X$="  D" THEN X$="  2"
470 IF X$="  S" THEN X$="  3"
480 IF X$=" SD" OR X$=" DS" THEN X$="  4"
490 D(LPR,J)=VAL(X$):NEXT J
500 GOTO 380
510 PRINT:CLOSE 1:LPR=LPR-1:DIM RCY$(0,51):IR=0
520 PRINT:INPUT"Aggregate from Country (C), World solution (W), or Support (S)
files";SOURCE$
530 IF SOURCE$="C" OR SOURCE$="W" OR SOURCE$="S" THEN 540 ELSE 520
540 SCODE$=""
550 IF SOURCE$="W" THEN 560 ELSE 580
560 PRINT:INPUT"Enter world model solution code";SCODE$
570 IF LEN(SCODE$)>2 GOTO 560
580 PRINT:INPUT"SUM (S (=default), Average (A), OR Weighted average (W)";TYPE$
590 IF LEN(TYPE$)>1 THEN 580
600 IF TYPE$="" THEN TYPE$="S"
610 IF TYPE$="W" THEN 620 ELSE 640
620 PRINT:INPUT"Letter of column containing aggregation weight ";WEIGHT$
630 IF WEIGHT$="" THEN 620
640 CLS:PRINT:PRINT"Possible countries/regions are:":PRINT
650 FOR I=1 TO LCY:PRINT CYM$(0,I);" ";:NEXT I:PRINT
660 PRINT:PRINT"included so far:";:FOR K=1 TO IR:PRINT " ";RCY$(0,K);:NEXT
K:PRINT
670 PRINT:INPUT"Enter 2 digit code of country/region to be aggregated ('ALL' for
ALL countries,    'Enter' to quit)";RRCY$
680 IF RRCY$="  " OR LEN(RRCY$)=0 THEN 800
690 IF RRCY$="ALL" THEN 780
700 FOR JC=1 TO LCY 'COUNTRY/REGION IS PEGGED AND CHECKED
710 IF RRCY$=CYM$(0,JC) THEN 740
720 NEXT JC
730 GOTO 640
740 FOR K=1 TO IR:IF RRCY$=RCY$(0,K) THEN 640
750 NEXT K
760 IR=IR+1:RCY$(0,IR)=RRCY$
770 GOTO 640
780 IR=LCY
790 FOR K=1 TO IR:RCY$(0,K)=CYM$(0,K):NEXT K
800 PRINT:PRINT"ADD CELL RANGE:":PRINT:INPUT"TOP LEFT CELL COLUMN (LETTERS) OF
BLOCK TO BE AGGREGATED";TLCOL$
810 IF SOURCE$="W" OR SOURCE$="C" THEN TLROW$=STR$(9+2*LPR):GOTO 830
820 INPUT"TOP LEFT CELL ROW (NUMBER) OF BLOCK TO BE AGGREGATED";TLROW$
830 PRINT:INPUT"BOTTOM RIGHT CELL COLUMN (LETTERS) OF BLOCK TO BE AGGREGATED
(PRESS 'ENTER' IF ONLY ONE COLUMN)";BRCOL$
840 IF BRCOL$="" THEN BRCOL$=TLCOL$
850 IF SOURCE$="W" OR SOURCE$="C" THEN BRROW$="":GOTO 870
860 INPUT"BOTTOM RIGHT CELL ROW (NUMBER) OF BLOCK TO BE AGGREGATED (PRESS
'ENTER' IF ALL COMMODITIES)";BRROW$
870 IF BRROW$="" THEN BRROW$=STR$(VAL(TLROW$)+LPR-1)
880 IF LEN(TLCOL$)=1 THEN TL$=" "+TLCOL$ ELSE TL$=TLCOL$
890 IF LEN(BRCOL$)=1 THEN BR$=" "+BRCOL$ ELSE BR$=BRCOL$
900 CNUMB=INSTR(CL$,TL$):CNUME=INSTR(CNUMB,CL$,BR$)
910 COLNUM=(CNUME-CNUMB+2)/2:IF COLNUM<1 THEN 800
920 TL$=TLCOL$+TLROW$:BR$=BRCOL$+BRROW$
930 TLW$=WEIGHT$+TLROW$:BRW$=WEIGHT$+BRROW$
940 PRINT:INPUT"ENTER COLUMN HEAD CELL (PRESS 'ENTER' FOR DEFAULT)";CHEAD$
950 PRINT:PRINT"IS BLOCK ";TL$;":";BR$;" (";COLNUM;" COLUMNS) OKAY (Y OR N)";
960 INPUT Y$:IF Y$="N" THEN 800
970 OFILE$=XO$+"TEST.XQT
980 OPEN"O",1,OFILE$
990 W$="{MACRO}":GOSUB 1910
1000 W$="{WINDOWSOFF}":GOSUB 1900
1010 W$="{PANELOFF}":GOSUB 1900
1020 W$="{STATUS "+CHR$(34)+"Aggregating variables in columns
"+TLCOL$+":"+BRCOL$+" from "+SOURCE$+CHR$(34)+"}":GOSUB 1900
1030 W$="{MESSAGE "+CHR$(34)+"Vernon Oley Roningen, Nielsville, Minn.
56568"+CHR$(34)+"}":GOSUB 1900
1040 W$="/GN":GOSUB 1880
1050 W$="=A1":GOSUB 1880
1060 W$=SOURCE$+"-"+TLCOL$+":"+BRCOL$:GOSUB 1880
1070 W$="=B2":GOSUB 1880:W$=" AGGREGATION = "+TYPE$:GOSUB 1880
1080 IF TYPE$="W" THEN 1090 ELSE 1100
1090 W$="=D2":GOSUB 1880:W$=" WEIGHT COL. = "+WEIGHT$:GOSUB 1880
1100 W$="=A1":GOSUB 1880
1110 FOR K=1 TO IR
1120 W$="="+MID$(CL$,(K-1)*2+3,2)+"1":GOSUB 1880
1130 W$=CHR$(34)+"+"+RCY$(0,K):GOSUB 1880
1140 NEXT K
1150 COL$="ABCDEFGHIJKLMNOPQRSTUVWXYZ"
1160 ROWNUM=VAL(BRROW$)-VAL(TLROW$)+1
1170 NM$=NAM$+"RW"
1180 IF SOURCE$="S" THEN NM$=FILE$+"S"+RCY$(0,1)
1190 IF CHEAD$="" THEN GOTO 1200 ELSE 1320
1200 IF SOURCE$="S" THEN BAC=2 ELSE BAC=1
1210 TITLE$=STR$(VAL(TLROW$)-BAC)
1220 IF (VAL(TLROW$)-BAC)>0 GOTO 1240
1230 PRINT:PRINT"Wrong cell row number! Try again":PRINT:GOTO 820
1240 TIT=INSTR(CL$,TLCOL$)
1250 G$=XI$+FILE$+"\"
1260 FOR K=1 TO COLNUM
```

```
1270 TIT$=MID$(CL$,(K-1)*2+TIT,2)
1280
W$="/L"+G$+NM$+",P"+TIT$+TITLE$+":"+TIT$+TITLE$+","+MID$(COL$,K*1+1,1)+"3":GOSUB
1880
1290 NEXT K
1300 W$="/FR3,TR":GOSUB 1880
1310 GOTO 1340
1320 G$=XI$+FILE$+"\"
1330 W$="/L"+G$+NM$+",P"+CHEAD$+":"+CHEAD$+",B3":GOSUB 1880
1340 W$="/L"+G$+NM$+",PA"+TLROW$+":A"+BRROW$+",A5":GOSUB 1880
1350 FOR R=1 TO ROWNUM:FOR C=1 TO COLNUM
1360 W$="="+MID$(COL$,C+1,1)+STR$(R+4):GOSUB 1880
1370 W$="0":GOSUB 1880
1380 W$="="+MID$(CL$,(C+52)*2+1,2)+STR$(R+4):GOSUB 1880
1390 W$="0":GOSUB 1880
1400 NEXT C,R
1410 FOR R=1 TO ROWNUM
1420 W$="=AA"+STR$(R+4):GOSUB 1880
1430 W$="0.00000001":GOSUB 1880:NEXT R
1440 W$="=A1":GOSUB 1880
1450 IF SOURCE$="W" THEN NAM$=NAM$
1460 FOR I=1 TO IR
1470 IF SOURCE$="S" THEN NAM$=FILE$+"S"+RCY$(0,I)
1480 IF SOURCE$="W" THEN
1490 IF SOURCE$="S" THEN START=VAL(TLROW$) ELSE START=9+2*LPR
1500 TL$=TLCOL$+STR$(START):BR$=BRCOL$+STR$(START+LPR-1)
1510 TLW$=WEIGHT$+STR$(START):BRW$=WEIGHT$+STR$(START+LPR-1)
1520 W$="/UAA:AZ":GOSUB 1880
1530 W$="/CBB5:BZ200,AB5":GOSUB 1880
1540 IF SOURCE$="S" THEN 1550 ELSE 1570
1550 W$="/L"+G$+NAM$+",P"+TL$+":"+BR$+",AB5,+":GOSUB 1880
1560 GOTO 1590
1570 IF SOURCE$="W" THEN NAM$=FILE$ ELSE NAM$=NAM$
1580 W$="/L"+G$+NAM$+RCY$(0,I)+SCODE$+",P"+TL$+":"+BR$+",AB5,+":GOSUB 1880
1590 IF TYPE$="S" THEN 1750
1600 IF TYPE$="A" THEN 1610 ELSE 1660
1610 FOR K=1 TO LCR:IF RCY$(0,I)=CYM$(0,K) THEN 1620:NEXT K
1620 FOR J=1 TO LPR:W$="=BA"+STR$(J+4):GOSUB 1880
1630 IF D(J,K)=0 THEN W$="0" ELSE W$="1"
1640 GOSUB 1880:NEXT J:W$="=A1":GOSUB 1880
1650 GOTO 1720
1660 W$="/UBA":GOSUB 1880:W$="/BBA":GOSUB 1880
1670 IF SOURCE$="S" THEN 1680 ELSE 1700
1680 W$="/L"+G$+NAM$+",P"+TLW$+":"+BRW$+",BA5,V":GOSUB 1880
1690 GOTO 1720
1700 IF SOURCE$="W" THEN NAM$=FILE$
1710 W$="/L"+G$+NAM$+RCY$(0,I)+SCODE$+",P"+TLW$+":"+BRW$+",BA5,V":GOSUB 1880
1720 W$="/CBA5:BA200,AA5,+":GOSUB 1880
1730 FOR C=1 TO COLNUM
1740 W$="/CBA5:BA200,"+MID$(CL$,(C+26)*2+1,2)+"5,*":GOSUB 1880:NEXT C
1750 W$="/CAB5:AZ200,B5,+":GOSUB 1880
1760 NEXT I
1770 IF TYPE$="S" THEN 1800 ELSE 1780
1780 FOR C=1 TO COLNUM
1790 W$="/CAA5:AA200,"+MID$(CL$,C*2+1,2)+"5,/":GOSUB 1880:NEXT C
1800 W$="=A1":GOSUB 1880
1810 W$="/FR1,TR":GOSUB 1880
1820 W$="/FEA1,TL":GOSUB 1880
1830 W$="/FG,G":GOSUB 1880
1840 W$="/S"+XO$+"AGVAR,A":GOSUB 1880
1850 CLOSE 1
1860 SYSTEM
1870 END
1880 PO=INSTR(W$," "):IF PO=0 THEN 1900
1890 W$=LEFT$(W$,PO-1)+RIGHT$(W$,LEN(W$)-PO):GOTO 1880
1900 PRINT #1,W$;WSQ$:RETURN
1910 PRINT #1,W$:RETURN
```

SWOPSIM Installation	Software and Hardware Requirements	Screen 1

SPREADSHEET: SuperCalc 5, version D, installed on C:\SC5.

MEMORY: At least 2MB of RAM memory available to SuperCalc 5 as EXPANDED memory. This usually requires an Expanded Memory System program (often machine specific) included in the CONFIG.SYS file. 3-4MB RAM is desirable. Need at least 3MB of fixed disk space on C:.

PATH: PATH command in AUTOEXEC.BAT should include C:\;C:\BATCH;C:\SC5; as well as subdirectory containing DOS commands.

DOS: DOS 3.3 or larger (must include CALL as DOS command).

DRIVE: D: MUST be designated as a drive. D: is used for all temporary output for SWOPSIM operations. A virtual D: drive from a VDISK program speeds SWOPSIM operations. An alternative is to use the DOS SUBST command to designate a fixed disk partition as D:.

```
:READSWOP.BAT  Type READSWOP to see installation instructions for SWOPSIM
ECHO OFF
CLS
TYPE %1READSWOP.SC1
PAUSE
CLS
TYPE %1READSWOP.SC2
PAUSE
CLS
TYPE %1READSWOP.SC3
PAUSE
CLS
```

```
:END ECHO ON
```

```
Installation of the SWOPSIM model -->  DEMO                    Screen 1

 AUTOMATIC:  From A:, type DEMOINS A: (or DEMOINS B: from B: drive).

 MANUAL:  Create C:\DEMO with MKDIR.  Copy *.EXE files to C:\DEMO, unPACk,
          and delete *.EXE files to save space.  Files are (O = optional):
          DEMOMAS.EXE  Master model, base data, and miscellaneous files
          DEMODAT.EXE  Country/region model spreadsheets
          DEMOPSE.EXE  Country/region support spreadsheets
          DEMOOUT.EXE  Sophisticated output templates for model DEMO
          DEMOWD.EXE   (O) World model spreadsheet
          DEMOSOL.EXE  (O) Illustrative solution file for world model DEMO

          In addition, DEMOBAT.EXE must be unPACked onto C:\BATCH.

          ELASPRN.EXE (O) and DATAPRN.EXE (O) may be unPACked somewhere to
          view or print PRN files of DEMO elasticities, base data, and
          support information.  Good luck and good DEMOing!
```

```
:READDEMO.BAT  Type READDEMO to see installation instructions for SWOPSIM
ECHO OFF
CLS
TYPE %1READDEMO.SC1
PAUSE
CLS
:END ECHO ON


:SWOPINS    Installation program
ECHO OFF
CLS
IF FILE%1 == FILE GOTO A1
GOTO A2
:A1
ECHO ERROR = You forgot to enter disk drive (A: or B:)
ECHO         Enter: SWOPINS A: (or SWOPINS B:)
GOTO END
:A2
IF EXIST C:\SC5\SC5.COM GOTO A3
ECHO ERROR = SC5 is not on C:\; you have not completed SuperCalc 5 installation!

GOTO END
:A3
%1
IF EXIST C:\SWOPSIM\EQNA.EXE GOTO A4
```

```
MKDIR C:\SWOPSIM
GOTO A5
:A4
ECHO C:\SWOPSIM already exists with old files.  Answer Y to overwrite file.
:A5
COPY SWOPSIM.EXE C:\SWOPSIM
C:
CD C:\SWOPSIM
SWOPSIM
ERASE SWOPSIM.EXE
CD \
%1
IF EXIST C:\BATCH\CREATE.BAT GOTO A6
MKDIR C:\BATCH
GOTO A7
:A6
.ECHO C:\BATCH already exists with old files.  Answer Y to overwrite file.
:A7
COPY BATCH.EXE C:\BATCH
C:
CD C:\BATCH
BATCH
ERASE BATCH.EXE
CD \
%1
COPY BASPROG.EXE C:
C:
COPY C:\BATCH\INOUT.TXT
BASPROG
ERASE BASPROG.EXE
C:
CLS
DIR C:\SWOPSIM/W
DIR C:\BATCH/W
DIR C:\BASRUN.*
%1
CALL DEMOINS %1
:END ECHO ON
C:
```

```
                    SWOPSIM Regional Share Program
-------------------------------------------------------------------------
USREGION        Program to print a model (NAME) solution (solution Code C)
                estimate for a selected US region or state (STATENAME).
REQUIREMENTS    Same as for SOUT.  Also, a file with production/consumption
                shares by region, USREGION.CAL, must exist on C:\NAME.
........A listing of full REGIONAME/STATENAME follows.....................
APPALACHIA      KENTUCKY, NORTH-CAROLINA, TENNESSEE, VIRGINIA, WEST-VIRGINIA.
CORN-BELT       ILLINOIS, INDIANA, IOWA, MISSOURI, OHIO.
DELTA-STATES    ARKANSAS, LOUISIANA, MISSISSIPPI.
LAKE-STATES     MICHIGAN, MINNESOTA, WISCONSIN.
```

```
MOUNTAIN-STATES  ARIZONA, COLORADO, IDAHO, MONTANA, NEVADA, NEW-MEXICO,
                 UTAH, WYOMING.
NORTHEAST        CONNECTICUT, DELAWARE, MAINE, MARYLAND, MASSACHUSETTS,
                 NEW-HAMPSHIRE, NEW-JERSEY, NEW-YORK, PENNSYLVANIA,
                 RHODE-ISLAND, VERMONT.
NORTHERN-PLAINS  KANSAS, NEBRASKA, NORTH-DAKOTA, SOUTH-DAKOTA.
PACIFIC-STATES   ALASKA, CALIFORNIA, HAWAII, OREGON, WASHINGTON.
SOUTHEAST        ALABAMA, FLORIDA, GEORGIA, SOUTH-CAROLINA.
SOUTHERN-PLAINS  OKLAHOMA, TEXAS.
-------------------------------------------------------------------------
COMMAND          USREGION  NAME  REGIONAME  C
-------------------------------------------------------------------------

:USREGION
ECHO OFF
CLS
ECHO                    SWOPSIM Regional Share Program
ECHO
-------------------------------------------------------------------------
ECHO USREGION           Program to print a model (NAME) solution (solution Code C)
ECHO                    estimate for a selected US region or state (STATENAME).
ECHO REQUIREMENTS       Same as for SOUT.  Also, a file with
production/consumption
ECHO                    shares by region, USREGION.CAL, must exist on C:\NAME.
ECHO ........A listing of full REGIONAME/STATENAME
follows.........................
ECHO APPALACHIA         KENTUCKY, NORTH-CAROLINA, TENNESSEE, VIRGINIA,
WEST-VIRGINIA.
ECHO CORN-BELT          ILLINOIS, INDIANA, IOWA, MISSOURI, OHIO.
ECHO DELTA-STATES       ARKANSAS, LOUISIANA, MISSISSIPPI.
ECHO LAKE-STATES        MICHIGAN, MINNESOTA, WISCONSIN.
ECHO MOUNTAIN-STATES    ARIZONA, COLORADO, IDAHO, MONTANA, NEVADA, NEW-MEXICO,
ECHO                    UTAH, WYOMING.
ECHO NORTHEAST          CONNECTICUT, DELAWARE, MAINE, MARYLAND, MASSACHUSETTS,
ECHO                    NEW-HAMPSHIRE, NEW-JERSEY, NEW-YORK, PENNSYLVANIA,
ECHO                    RHODE-ISLAND, VERMONT.
ECHO NORTHERN-PLAINS    KANSAS, NEBRASKA, NORTH-DAKOTA, SOUTH-DAKOTA.
ECHO PACIFIC-STATES     ALASKA, CALIFORNIA, HAWAII, OREGON, WASHINGTON.
ECHO SOUTHEAST          ALABAMA, FLORIDA, GEORGIA, SOUTH-CAROLINA.
ECHO SOUTHERN-PLAINS    OKLAHOMA, TEXAS.
ECHO
-------------------------------------------------------------------------
ECHO COMMAND            USREGION  NAME  REGIONAME  C
ECHO
-------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: USREGION NAME
REGIONAME C
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot REGIONAME; Enter: USREGION NAME
REGIONAME C
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot solution code Letter; Enter: USREGION
NAME REGIONAME C
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\%1WM%3.CAL GOTO C1
ECHO ERROR = %1WM%3.CAL solution file does not exist on the C:\%1 subdirectory!
GOTO END
:C1
IF EXIST C:\%1\%1bUS.CAL GOTO C2
ECHO ERROR = US does not exist in model %1!
GOTO END
:C2
IF EXIST D:*.CAL ERASE D:*.CAL
IF EXIST D:*.XQT ERASE D:*.XQT
IF EXIST D:?. ERASE D:?.
COPY C:\%1\%1bUS.CAL D:B.CAL
COPY C:\%1\%1SOUT.CAL D:
COPY C:\SWOPSIM\USREGION.CAL D:US.CAL
ECHO {MACRO}{PANELOFF}{STATUS "Estimating effect of simulation %1WM%3 on %2")
>D:A
ECHO /LC:\%1\%1WM%3~ >D:B
CALL C:\BATCH\%1SOUT US
ECHO /UAC53:AE74~ >>D:B
ECHO /LD:US,P%2-P,AC53,*~ >>D:B
ECHO /LD:US,P%2-C,AD53,*~ >>D:B
ECHO /LC:\%1\%1bUS,PAE53:AE74,AE53~!~ >>D:B
ECHO /PAC53:AE74~ >>D:B
ECHO /SD:T~V~/Z,Y~ >>D:B
ECHO /LD:B~ >>D:B
REM Call batch file containing row and column layout of model
CALL C:\BATCH\%1ROWC
ECHO /LD:US,P%2-P,G53,*~ >>D:B
ECHO /LD:US,P%2-C,H53,*~ >>D:B
ECHO /LD:US,P%2-P,BQ53,*~ >>D:B
ECHO /LD:US,P%2-C,BR53,*~ >>D:B
ECHO /LD:US,P%2-C,CG53,*~ >>D:B
ECHO /SD:S,A~/Z,Y~ >>D:B
ECHO /LD:T,V~/LD:S,A~!~ >>D:B
ECHO /SD:O~V~ >>D:B
ECHO /Z,Y~/LD:B,A~ >>D:B
ECHO /UBD53:BE74~ >>D:B
ECHO /LD:US,P%2-P,BD53,*~ >>D:B
ECHO /LD:US,P%2-P,BE53,*~ >>D:B
ECHO /PBD53:BE74~ >>D:B
ECHO /LD:US,P%2-P,BQ53,*~ >>D:B
ECHO /LD:US,P%2-C,BR53,*~ >>D:B
ECHO /LD:US,P%2-C,CG53,*~ >>D:B
ECHO !~/SD:B~OV~ >>D:B
ECHO /Z,Y~/LC:\%1\%1WM%3~S1~A~/SD:W~V~ >D:C
ECHO /Z,Y~/LD:%1SOUT,A~!~ >D:D
ECHO =B4~%2~ >>D:D
ECHO =B29~%2~ >>D:D
ECHO =B54~%2~ >>D:D
ECHO =B81~%2~ >>D:D
```

```
ECHO =B107~%2~ >>D:D
ECHO =E132~%2~ >>D:D
ECHO /OPGQ~/SD:%2~V~/Q,Y >>D:D
COPY D:A+D:B+D:C+D:D D:TEST.XQT
ERASE D:?
REM Call batch file to set print size
CALL C:\BATCH\PRINTSOL
CALL C:SC D:TEST
ERASE D:?.CAL
ERASE D:US.CAL
ERASE D:%1SOUT.CAL
ERASE D:TEST.XQT
CLS
DIR D:*.*/W
:END ECHO ON
```

SWOPSIM Regional Share Program

ECREGION	Program to print a model (NAME) solution (solution code C) estimate for a selected EC region or country (REGIONAME). 1988 country production and consumption shares are used to apportion EC (12) data. EC results are pro-rated for the selected region and printed out in the solution format.
REQUIREMENTS	Same as for SOUT. Also, a file with production /consumption shares by region, ECREGION.CAL, must exist on C:\NAME subdirectory.
OUTPUT (D:)	A printout and REGIONAME.CAL file of EC results pro-rated for the selected EC country/region.

.....A listing of full REGIONAMEs follows.....

NORTHERN EUROPE	BELGIUM-LUXEMBOURG, DENMARK, GERMANY, IRELAND, NETHERLANDS, UNITED-KINGDOM.
SOUTHERN EUROPE	FRANCE, GREECE, ITALY, PORTUGAL, SPAIN.

COMMAND ECREGION NAME REGIONAME C

```
:ECREGION
ECHO OFF
CLS
ECHO                    SWOPSIM Regional Share Program
ECHO
---------------------------------------------------------------------------
ECHO ECREGION           Program to print a model (NAME) solution (solution code
C)
ECHO                    estimate for a selected EC region or country (REGIONAME).
ECHO                    1988 country production and consumption shares are used
to
ECHO                    apportion EC (12) data.  EC results are pro-rated for the
ECHO                    selected region and printed out in the solution format.
ECHO REQUIREMENTS       Same as for SOUT.  Also, a file with production
ECHO                    /consumption shares by region, ECREGION.CAL, must exist
on
ECHO                    C:\NAME subdirectory.
ECHO OUTPUT (D:)        A printout and REGIONAME.CAL file of EC results pro-rated
ECHO                    for the selected EC country/region.
ECHO .............A listing of full REGIONAMEs
follows.............................
ECHO NORTHERN EUROPE    BELGIUM-LUXEMBOURG, DENMARK, GERMANY, IRELAND,
ECHO                    NETHERLANDS, UNITED-KINGDOM.
ECHO SOUTHERN EUROPE    FRANCE, GREECE, ITALY, PORTUGAL, SPAIN.
ECHO
---------------------------------------------------------------------------
ECHO COMMAND            ECREGION  NAME  REGIONAME C
ECHO
---------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = You forgot model NAME; Enter: ECREGION NAME
REGIONAME C
IF FILE%1 == FILE GOTO END
IF FILE%2 == FILE ECHO ERROR = You forgot REGIONAME; Enter: ECREGION NAME
REGIONAME C
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot solution code Mark; Enter: ECREGION
NAME REGIONAME C
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\%1WM%3.CAL GOTO C1
ECHO ERROR = %1WM%3.CAL solution file does not exist on the C:\%1 subdirectory!
GOTO END
:C1
IF EXIST C:\%1\%1bEC.CAL GOTO C2
ECHO ERROR = EC does not exist in model %1!
GOTO END
:C2
IF EXIST D:*.CAL ERASE D:*.CAL
IF EXIST D:*.XQT ERASE D:*.XQT
IF EXIST D:?. ERASE D:?.
COPY C:\%1\%1bEC.CAL D:B.CAL
COPY C:\%1\%1SOUT.CAL D:
COPY C:\SWOPSIM\ECREGION.CAL D:EC.CAL
ECHO {MACRO}{PANELOFF}{STATUS "Estimating effect of simulation %1WM%3 on %2"}
>D:A
REM REMEMBER TO CHANGE 'S2' TO PROPER PAGE NUMBER FOR MODEL AND COUNTRY
ECHO /LC:\%1\%1WM%3~ >D:B
CALL C:\BATCH\%1SOUT EC >>D:B
ECHO /UAC53:AE74~ >>D:B
ECHO /LD:EC,P%2-P,AC53,*~ >>D:B
ECHO /LD:EC,P%2-C,AD53,*~ >>D:B
ECHO /LC:\%1\%1bEC,PAE53:AE74,AE53~!~ >>D:B
ECHO /PAC53:AE74~ >>D:B
ECHO /SD:T~V~/Z,Y~ >>D:B
ECHO /LD:B~ >>D:B
REM Call batch file containing row and column layout of model
CALL C:\BATCH\%1ROWC
ECHO /LD:EC,P%2-P,G53,*~ >>D:B
```

```
ECHO /LD:EC,P%2-C,H53,*~ >>D:B
ECHO /LD:EC,P%2-P,BQ53,*~ >>D:B
ECHO /LD:EC,P%2-C,BR53,*~ >>D:B
ECHO /LD:EC,P%2-C,CG53,*~ >>D:B
ECHO /SD:S,A~/Z,Y~ >>D:B
ECHO /LD:T,V~/LD:S,A~!~ >>D:B
ECHO /SD:O~V~ >>D:B
ECHO /Z,Y~/LD:B,A~ >>D:B
ECHO /UBD53:BE74~ >>D:B
ECHO /LD:EC,P%2-P,BD53,*~ >>D:B
ECHO /LD:EC,P%2-P,BE53,*~ >>D:B
ECHO /PBD53:BE74~ >>D:B
ECHO /LD:EC,P%2-P,BQ53,*~ >>D:B
ECHO /LD:EC,P%2-C,BR53,*~ >>D:B
ECHO /LD:EC,P%2-C,CG53,*~ >>D:B
ECHO !~/SD:B~OV~ >>D:B
ECHO /Z,Y~/LC:\%1\%1WM%3~S1~A~/SD:W~V~ >D:C
ECHO /Z,Y~/LD:%1SOUT,A~!~ >D:D
ECHO =B4~%2~ >>D:D
ECHO =B29~%2~ >>D:D
ECHO =B54~%2~ >>D:D
ECHO =B81~%2~ >>D:D
ECHO =B107~%2~ >>D:D
ECHO =E132~%2~ >>D:D
ECHO /OPGQ~/SD:%2~V~/Q,Y >>D:D
COPY D:A+D:B+D:C+D:D D:TEST.XQT
ERASE D:?
REM Call batch file to set print size
CALL C:\BATCH\PRINTSOL
CALL C:SC D:TEST
ERASE D:?.CAL
ERASE D:EC.CAL
ERASE D:%1SOUT.CAL
ERASE D:TEST.XQT
CLS
DIR D:*.*/W
:END ECHO ON
```

The next set of programs documented briefly are the tutorial programs which come with the SWOPSIM installation disk. Only the main program is shown. The tutorials are simply a series of DOS batch programs which display pre-designed screen, call SWOPSIM programs, or write SuperCalc 5 macros to carry out selected spreadsheet operations (that might be done by manually under normal circumstances). The user should press only the 'Enter' key when responding to tutorial prompts. If the user is interested in seeing the remainder of the tutorial programs, he can list them from the batch subdirectory.

The tutorials illustrate the power and simplicity of a combination of DOS batch programs which write macros and/or call SWOPSIM routines. The tutorials, as well as most SWOPSIM output routines for SuperCalc 5, have avoided the extra complexity of BASIC programming. DOS batch programs can easily write simple macros and are easier to de-bug than complex BASIC programs which do the same.


```
SWOPSIM TUTORIAL          SWOPSIM TUTORIAL OVERVIEW          Screen 1

    Welcome to the SWOPSIM demonstration tutorial program.  You can
    select part or all of the steps required to build and exercise a
    small demonstration model SMAL.  The screens and text of this
    tutorial are also presented in the ERS report documenting SWOPSIM.

    Pause points in the tutorial, marked by "Strike a key when ready .",
    give you time to read the screens.  At times, SWOPSIM programs will
    ask you to make selections; just press 'Enter' to select the default
    option.  Do not try to modify the default options in this tutorial!
    Note that at a pause point, you can break out of a program by
    entering a Ctrl C.  The tutorial, like all SWOPSIM programs, puts
    all output on the D: drive before it is permanently saved.  Before
    you continue, you should save any files you want to keep on the D:
    drive and then remove them from the D: drive.

    Selection options for the tutorial are presented after SuperCalc 5 is
    configured.  Follow the instruction below, "Strike a key when ready ."
```

```
:SWOPTUT
ECHO OFF
CLS
IF NOT F%1 == F GOTO :C1
TYPE C:\SWOPSIM\SCRN1
PAUSE
CLS
TYPE C:\SWOPSIM\SCRN4
ECHO CALL SC C:\SWOPSIM\SETSC5
PAUSE
CALL SC C:\SWOPSIM\SETSC5
ECHO OFF
CLS
TYPE C:\SWOPSIM\SCRN2
PAUSE
GOTO END
:C1
IF NOT EXIST D:*.* GOTO :C2
TYPE C:\SWOPSIM\SCRN3
ECHO DIR D:/W
DIR D:/W
PAUSE
GOTO END
:C2
IF F%1 == FALL SWOPTUTA ALL
IF F%1 == FA SWOPTUTA
IF F%1 == FB SWOPTUTB
IF F%1 == FC SWOPTUTC
IF F%1 == FD SWOPTUTD
```

```
IF F%1 == FE SWOPTUTE
IF F%1 == FF SWOPTUTF
IF F%1 == FG SWOPTUTG
IF F%1 == FH SWOPTUTH
IF F%1 == FI SWOPTUTI
:END ECHO ON
```

ARMINGTON TUTOR | ARMINGTON TUTOR OVERVIEW | Screen 1

Welcome to the SWOPSIM Armington model tutorial program. You can select part or all of the steps required to build and exercise a Little ARMington demonstration model LARM. The screens and text of this tutorial are also presented in ERS SWOPSIM documentation.

Pause points in the tutorial, marked by "Strike a key when ready .", give you time to read the screens. At times, SWOPSIM programs will ask you to make selections; just press 'Enter' to select the default option. Do not try to modify the default options in this tutorial! Note that at a pause point, you can break out of a program by entering a Ctrl C. The tutorial, like all SWOPSIM programs, puts all output on the D: drive before it is permanently saved. Before you continue, you should save any files you want to keep on the D: drive and then remove them from the D: drive.

Selection options for the tutorial are presented after SuperCalc 5 is configured. Follow the instruction below, "Strike a key when ready ."

```
:SWOPARM
ECHO OFF
CLS
IF NOT F%1 == F GOTO :C1
TYPE C:\SWOPSIM\ASCRN1
PAUSE
CLS
TYPE C:\SWOPSIM\ASCRN4
ECHO CALL SC C:\SWOPSIM\SETSC5
PAUSE
CALL SC C:\SWOPSIM\SETSC5
ECHO OFF
CLS
TYPE C:\SWOPSIM\ASCRN2
PAUSE
GOTO END
:C1
IF NOT EXIST D:*.* GOTO :C2
TYPE C:\SWOPSIM\ASCRN3
ECHO DIR D:/W
DIR D:/W
PAUSE
GOTO END
:C2
IF F%1 == FALL SWOPARMA ALL
IF F%1 == FA SWOPARMA
IF F%1 == FB SWOPARMB
IF F%1 == FC SWOPARMC
IF F%1 == FD SWOPARMD
IF F%1 == FE SWOPARME
IF F%1 == FF SWOPARMF
IF F%1 == FG SWOPARMG
IF F%1 == FH SWOPARMH
IF F%1 == FI SWOPARMI
:END ECHO ON
```

SWOPSIM Specialized Output Program for Standard Model

COMPARE	A batch program to print out solution results for 3 countries/regions for a selected solution.
REQUIREMENTS	Solution files for each country/region in model created by the SOUT progam (stored on the model subdirectory). A COMPARE.CAL template file must be on each model subdirectory - this file is commodity and country specific. A NAMECOMP.BAT and NAMECOM3.BAT customized batch file MUST be on C:\BATCH subdirectory for each model. THREE regions can be selected for commodity comparison--they MUST have a NAMECOM3.XQT file pre-specified on the model subdirectory & a NAMECOM3.BAT file pre-specified on the BATCH subirectory. Enter model NAME, solution Letter (or number), and P (Print) or F (File) for output disposition.
OUTPUT (D:)	Printouts of solution (if option P is chosen) information by commodity. Commodity CAL files and aggregates will be on the D: drive (appended with the solution Letter).

COMMAND COMPARE NAME L P (or F)

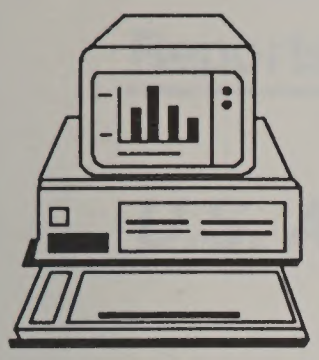
```
:COMPARE
ECHO OFF
CLS
ECHO                SWOPSIM Specialized Output Program for Standard Model
ECHO ---------------------------------------------------------------------
ECHO COMPARE        A batch program to print out solution results for 3
ECHO                countries/regions for a selected solution.
ECHO REQUIREMENTS   Solution files for each country/region in model created
ECHO                by the SOUT progam (stored on the model subdirectory).
ECHO                A COMPARE.CAL template file must be on each model
ECHO                subdirectory - this file is commodity and country specific.
ECHO                A NAMECOMP.BAT and NAMECOM3.BAT customized batch file must
ECHO                be on C:\BATCH subdirectory for each model.  THREE regions
ECHO                can be selected for commodity comparison--they MUST have a
```

```
ECHO              NAMECOM3.XQT file pre-specified on the model subdirectory &
ECHO              a NAMECOM3.BAT file pre-specified on the BATCH subirectory.
ECHO              Enter model NAME, solution Letter (or number), and P (Print)
ECHO              or F (File) for output disposition.
ECHO OUTPUT (D:)  Printouts of solution (if option P is chosen) information
ECHO              by commodity.  Commodity CAL files and aggregates will be
ECHO              on the D: drive (appended with the solution Letter).
ECHO ------------------------------------------------------------------------
ECHO COMMAND        COMPARE  NAME  L  P  (or F)
ECHO ------------------------------------------------------------------------
IF FILE%1==FILE ECHO ERROR=You forgot model NAME; Enter COMPARE NAME L P (or F)
IF FILE%1 == FILE GOTO END
IF FILE%2==FILE ECHO ERROR=You forgot solution Letter; Enter COMPARE NAME L P
(or F)
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = You forgot P (Print) or F (File) code; Enter
COMPARE NAME L P(or F)
IF FILE%3 == FILE GOTO END
IF EXIST C:\%1\COMPARE.CAL GOTO C1
ECHO COMPARE.CAL is not available on the C:\%1 subdirectory.  It must be
ECHO customized/created for the model %1.
GOTO END
:C1
IF EXIST C:\BATCH\%1COMP.BAT GOTO C2
ECHO %1COMP.BAT file is not available on the C:\BATCH subdirectory.
ECHO It must be customized/created for the model %1.
GOTO END
:C2
IF EXIST C:\%1\%1COM3.XQT GOTO C3
ECHO %1COM3.XQT file is not available on the C:\%1 subdirectory!
ECHO It must be created and customized for the 3 countries selected.
GOTO END
:C3
IF EXIST C:\%1\%1WM%2.CAL GOTO C4
ECHO Solution %1wm%2 does not exist on the C:\%1 subdirectory!
GOTO END
:C4
IF EXIST C:\BATCH\%1COM3.BAT GOTO C5
ECHO %1COM3.BAT does not exist on the C:\BATCH subdirectory!
GOTO END
:C5
IF EXIST D:C.XQT ERASE D:C.XQT
IF EXIST D:D.XQT ERASE D:D.XQT
IF EXIST D:??%2.CAL ERASE D:??%2.CAL
CALL C:\BATCH\%1COM3 %2
IF F%3 == FP CALL C:\BATCH\PRINTSOL
ECHO {MACRO} >D:D.XQT
ECHO /LC:\%1\COMPARE,A~ >>D:D.XQT
COPY D:D.XQT+C:\%1\%1COM3.XQT D:C.XQT
ERASE D:D.XQT
ECHO {PANELOFF} >>D:C.XQT
ECHO {STATUS "Creating comparative files for %1 solution %2"} >>D:C.XQT
ECHO {MESSAGE "Vernon Oley Roningen, Nielsville, Minn. 56568"} >>D:C.XQT
REM A NAMECOMP file must be on the batch subdirectory for each model.  It is
REM customized to the number of commodities in the model and the number
REM of countries/regions compared in the output.
CALL C:\BATCH\%1COMP %1 %2 %3
ECHO /Q,Y~ >>D:C.XQT
CALL SC D:C
ERASE D:C.XQT
ERASE D:D.XQT
DIR D:*.*/W
:END ECHO ON
```

```
.                 A SWOPSIM Utility for Printing Part of a SuperCalc 5 File
------------------------------------------------------------------------------
PRINTSC           A batch program to Print a SuperCalc file on an HP Laser
                  printer in small print or put it out to disk file (80
                  characters per page with 209 characters in a line).
REQUIREMENTS      A SuperCalc file somewhere on the machine. Enter the drive
                  and full File name (e.g. D:TEST or C:\SWOPSIM\NAMEWORK),
                  the top left and bottom right cells (Beginning Position and
                  End Position) of spreadsheet to be printed followed by a
                  P or F to indicate Printing or disk File.  A full command
                  might look like:  C:\DEMO\DEMObUS A1 G19 P (omit .CAL).
OUTPUT (D:)       Printout of selected file in the HPLASER LANDSMAL format
                  or ASCII file on disk for printing with another printer.
                  If file is put on disk, it will be named PRINTSC.PRN.
------------------------------------------------------------------------------
COMMAND       PRINTSC FL BP EP P (or F)
------------------------------------------------------------------------------

:PRINTSC
ECHO OFF
CLS
ECHO              A SWOPSIM Utility for Printing Part of a SuperCalc 5 File
ECHO ------------------------------------------------------------------------
ECHO PRINTSC      A batch program to Print a SuperCalc file on an HP Laser
ECHO              printer in small print or put it out to disk file (80
ECHO              characters per page with 209 characters in a line).
ECHO REQUIREMENTS A SuperCalc file somewhere on the machine. Enter the drive
ECHO              and full File name (e.g. D:TEST or C:\SWOPSIM\NAMEWORK),
ECHO              the top left and bottom right cells (Beginning Position and
ECHO              End Position) of spreadsheet to be printed followed by a
ECHO              P or F to indicate Printing or disk File.  A full command
ECHO              might look like:  C:\DEMO\DEMObUS A1 G19 P (omit .CAL).
ECHO OUTPUT (D:)  Printout of selected file in the HPLASER LANDSMAL format
ECHO              or ASCII file on disk for printing with another printer.
ECHO              If file is put on disk, it will be named PRINTSC.PRN.
ECHO ------------------------------------------------------------------------
ECHO COMMAND      PRINTSC FL BP EP P (or F)
ECHO ------------------------------------------------------------------------
IF FILE%1 == FILE ECHO ERROR = File Location/name?; Enter PRINTSC FL BP EP P (or
```

```
F)
IF FILE%1 == FILE GOTO END
IF EXIST %1.CAL GOTO C1
ECHO ERROR = %1.CAL does not exist!
GOTO END
:C1
IF FILE%2 == FILE ECHO ERROR = Beg. Position?; Enter PRINTSC FL BP EP P (or F)
IF FILE%2 == FILE GOTO END
IF FILE%3 == FILE ECHO ERROR = End Position?; Enter PRINTSC FL BP EP P (or F)
IF FILE%3 == FILE GOTO END
IF FILE%4 == FILE ECHO ERROR = Print or File?; Enter PRINTS FL BP EP P (or F)
IF FILE%4 == FILE GOTO END
IF EXIST D:PRINTSC.PRN ERASE D:PRINTSC.PRN
IF F%4 == FP CALL HPLASER LANDSMAL
ECHO (MACRO) >D:TEST.XQT
ECHO /L%1,R^ >>D:TEST.XQT
IF F%4 == FP ECHO /OPOLP80^W209^ >>D:TEST.XQT
IF F%4 == FF ECHO /OFD:PRINTSC^OLP80^W209^ >>D:TEST.XQT
ECHO QOBY^OR%2:%3^GQ^ >>D:TEST.XQT
ECHO /Q,Y^ >>D:TEST.XQT
CALL SC D:TEST
ERASE D:TEST.XQT
:END ECHO ON
```



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